Comments and Responses - Federal Government

ID	Comment	Response
Army Corps of Engineers		
38106-1	We are responding to the request for comments on the Clark, Lincoln and White Pine Counties Groundwater Development Project Draft Environmental Impact Statement. The identification number is SPK-2009-00594.	This comment should not have been marked as substantive. No response necessary.
38106-2	The Corps of Engineers' jurisdiction within the study area is under the authority of Section 404 of the Clean Water Act for the discharge of dredged or fill material into waters of the United States. Waters of the United States include, but are not limited to, rivers, perennial or intermittent streams, lakes, ponds, wetlands, vernal pools, marshes, wet meadows, and seeps. Project features that result in the discharge of dredged or fill material into waters of the United States will require Department of the Army authorization prior to starting work.	Thank you for information regarding the Corps 404 permit requirements.
38106-3	Nationwide Permit #12 applies to activities required for the construction, maintenance, repair, and removal ofutility lines and associated facilities in waters of the United States, provided the activity does not result in the loss of greater than 112 acre of waters of the United States.	Thank you for the information regarding the Nationwide #12 permitting requirements.
38106-4	However, the Corps may exert discretionary authority and require an alternate permitting mechanism in cases where activities will result in more than minimal individual and cumulative impacts.	Thank you for the information on Corps permitting requirements.
38106-5	The Corps will require a pre-construction notification for this project because of the adverse cumulative impacts to waters of the U.S., especially those impacts associated with the long-term effects of drawdown on wetland habitat.	The requirement for pre-construction notification is noted.
38106-6	The Corps is required to analyze alternatives for the "least environmentally damaging alternative" or LEDPA. This is in accordance with the Clean Water Act Section 404 (b) (1) guidelines that are attached to this document. The Corps may not adopt the "preferred alternative" presented in the FEIS.	The requirement for the Corps' alternatives evaluation is noted.
38106-7	The range of alternatives considered for this project should include alternatives that avoid impacts to wetlands or other waters of the United States. Every effort should be made to avoid project features which require the discharge of dredged or fill material into waters of the United States.	Please refer to standard resource responses Gen-3 and Gen-5 for information relevant to this comment.
38106-8	In the event it can be clearly demonstrated there are no practicable alternatives to filling waters of the United States, mitigation plans should be developed to compensate for the unavoidable losses resulting from project implementation.	The BLM's COM Plan will consider compensation or other measures if there are no practicable alternatives to filling waters of the U.S. Minor impacts to waters of the U.S. from construction of the pipeline and power line ROWs. Impacts to waters of the U.S. from future groundwater development will be addressed in subsequent NEPA and COM Plann development.
38106-9	The Corps has specific comments relating to the DEIS. The indirect and cumulative impacts to "Waters ofthe U.S.", including wetlands, were significant enough to warrant a separate analysis. Wetlands should be addressed separately and not included in an analysis ofvegetation. Linear stream impacts should also be listed as quantified and reported as acres of potentially lost habitat.	Section 3.5 (vegetation) has been revised to reflect the main points of this comment. See also standard resource response Gen-1 and Gen-2.
38106-10	Please refer to identification number SPK-2009-00594 in any correspondence concerning this project. If you have any questions, please contact Patricia Mcqueary at 321 North Mall Drive, Suite L-101, St. George, Utah 84790, email Patricia.L.McQueary@usace.army.mil, or telephone 435-986-3979. For more information regarding our program, please visit our website at www.spk.usace.army.mil/regu/atory.html.	This comment should not have been marked as substantive. No response necessary.
EPA		
38108-1	The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEP A review authority under Section 309 of the Clean Air Act. Our detailed comments are enclosed. We greatly appreciate the individual EPA extension of the comment deadline date from October 11, 2011 to November 30, 2011.	This comment should not have been marked as substantive. No response necessary.
38108-2	EPA acknowledges BLM's use of a "tiered" approach to implement NEPA for this project. The Draft Environmental Impact Statement (DEIS) includes a programmatic analysis of environmental effects associated with the Southern Nevada Water Authority's (SNWA) prospective future groundwater development, which is contingent upon future appropriation by the Nevada State Engineer (NSE).	This comment should not have been marked as substantive. No response necessary.
38108-3	It is expected that once SNW A identifies specific details of the groundwater development components, it will submit additional ROW applications to BLM and, in tum, BLM will address these future sitespecific components in subsequent tiered NEP A documents. We look forward to providing comments on these future NEPA documents.	Your comment is noted regarding future development and subsequent NEPA analyses.
38108-4	It is expected that once SNW A identifies specific details of the groundwater development components, it will submit additional ROW applications to BLM and, in tum, BLM will address these future sitespecific components in subsequent tiered NEP A documents. We look forward to providing comments on these future NEPA documents.	Thank you for your comment.
38108-5	A decision from the NSE regarding the water rights for the basins that would be pumped under Alternatives D and E is expected early next year.	Comment noted.

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38108-6	We also acknowledge that projected population growth in the Las Vegas region cannot be supported without an additional water supply, and that the region needs greater water supply reliability during emergencies and drought, and to adapt to climate change.	This text should not have been bracketed as a comment.
38108-7	We appreciate the wide range of alternatives which have been presented in the DEIS. Consistent with the views of the US Fish and Wildlife Service Printed on Recycled Paper and National Park Service, we believe that Alternatives D and E, when combined with additional demand management measures and modified for intermittent pumping needed for drought and emergencies, as proposed for Alternative C, would substantially reduce impacts identified in the DEIS and would fulfill the SNWA's need for an additional water supply.	Thank you for expressing your concerns. While statements of opinion do not require specific responses or text revisions under the NEPA regulations, they will be considered by the BLM and documented in the administrative record associated with this EIS.
38108-8	We note that the geographical extent of the ROW identified in the Lincoln County Conservation, Recreation, and Development Act of2004, which is BLM's legislative requirement to grant a ROW, more closely matches that of Alternatives D and E.1	The EIS describes the LCCRDA and how it applies to Alternative D.
38108-9	The DEIS describes extensive hydrological modification on over 5,000 square miles of Nevada and Utah - an area larger than the State of Connecticut - lowering groundwater levels and depleting aquifers, altering vegetation regimes, and eliminating high-quality habitat. According to the DEIS, the proposed action would result in regionally extensive groundwater draw down cones, the potential loss of thousands of acres of wetlands through succession to non-wetland vegetation, and the transformation of large areas of basin shrub vegetation,2 with repercussions on habitat carrying capacity and animal displacement on a long-term basis.	Thank you for expressing your concerns related to the Draft EIS. Your suggestions have been carefully considered by the BLM, but have not resulted in changes to the analyses presented in this document.
38108-10	Eight of the 26 highest priority wetland conservation areas designated by the Nevada Natural Heritage Program are located within White Pine County in the area of influence ofthe proposed project.	The EIS analyzes the effects of groundwater pumping on wetlands in Section 3.5, Vegetation. Based on this comment, text has been added to section 3.5.1.4.
38108-11	The groundwater drawdown is also predicted to affect livestock forage production, with vegetation transformed in 20% of grazing allotment acreage after 75 years, and livestock water sources irretrievably lost, contributing to potentially substantial long-term adverse economic and social effects in rural areas.	For the Proposed Action, the potential transformation of wetland/meadow and basin shrubland vegetation does equate to 20 percent of the total allotment area within the region of study, however this would not reduce total forage vegetation production by 20 percent as the transformation would likely result in some form of grazable vegetation. Some water sources would be lost to groundwater drawdown and supplemental water sources may need to be provided.
38108-12	The DEIS includes a mitigation and adaptive management plan. However, in several instances, BLM acknowledges that mitigation may not be feasible or available for all locations, and states that groundwater development presumes a certain level of change to vegetation and air quality and a significant reduction in groundwater levels in some areas.	Please refer to the standard resource responses MM-1 and MM-2 for information on this topic.
38108-13	BLM defers all decisions regarding mitigation to future implementation and technical stakeholder committees, to be determined by consensus. There is no specific commitment to mitigate or maintain a minimal level of ecosystem function and health included in the current mitigation and adaptive management plan.	Please refer to the standard resource responses Gen-1, Gen-2, MM-1, MM-2 and MM-3 for information on this topic.
38108-14	We are also concerned with the estimated releases of wind-blown particulate matter projected for the 5,000 square mile 10-foot + drawdown area.	Please refer to to standard resource responses Air-7 and Air-9 for information on this topic.
38108-15	Because no air modeling was performed, the DEIS does not provide an estimate of how these impacts will affect air quality and public health, including the ability of Provo, Salt Lake County, and Ogden, Utah and Clark County, Nevada to attain air quality standards for these pollutants. Portions of these areas already do not meet air quality standards for PM10, and/or PM2.5• Windblown dust emissions could also impair visibility conditions at Great Basin National Park.	Please see standard resource responses Air-1, Air-2, Air-5, Air-7, Air-8, Air-9 and Air-14 for information on this topic.
38108-16	Based on the information in the DEIS, we believe the project's indirect and cumulative impacts to aquatic resources are significant, and that an "Individual" permit (rather than a "Nationwide" general permit) should be sought for any Clean Water Act Section 404 discharges of fill into jurisdictional waters of the U.S.	The comment on the Corps' 404 permitting requirements is noted.
38108-17	The Final EIS should evaluate the ability to meet the requirements of the CWA Section 404's compensatory mitigation rule, and discuss the opportunities that may exist for compensatory mitigation in the project area.	Thank you for your comment. Please see Standard Resource Response MM-1.
38108-18	We also understand that there is strong opposition to the project by several tribes. We encourage BLM, as the lead Federal agency, to continue its formal government-to-government consultation with the appropriate Nevada and Utah tribal leaders, in accordance with Executive Order 13175 ofNovember 6, 2000, "Consultation and Coordination with Indian Tribal Governments."	Thank you for your comment. Government-to-government consultation is ongoing.

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38108-19	ADEQUACY OF THE IMPACT STATEMENTCategory "1" (Adequate)EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.Category "2" (Insufficient Information)The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.Category "3" (Inadequate)EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional• information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.*From EPA Manuall640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.	This text is a list of definitions and should not have been marked as substantive. No response necessary.
38108-20	While we commend BLM for the well organized and detailed information in the DEIS, there is a need for evaluation of the effects of groundwater draw down of less than 10 feet, characterization of the deep carbonate aquifer and its interaction with shallower alluvial aquifers, and a quantitative air modelling analysis to determine the potential for exceedences of the National Ambient Air Quality Standards and/or visibility impairment to the Great Basin National Park.	See response WR-1 regarding the justification for the use of the 10-foot drawdown contour for the programatic level assessment of drawdown effects.
38108-21	For the mitigation and adaptive management plan, we recommend that specific ecosystem health objectives be identified so that the nature and magnitude of impacts that would be deemed acceptable and allowed to occur can be disclosed. The probable effectiveness of the mitigation strategy as a whole in preserving key environmental attributes and ecosystem functions in the region should be assessed in the Final EIS (FEIS).	Thank you for your comment. Please see Standard Resource Response MM-1.
38108-22	SUMMARY OF EPA RATING DEFINITIONSThis rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).ENVIRONMENTAL IMPACT OF THE ACTION"LO" (Lack of Objections)The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal."EC" (Environmental Concerns)The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts."EO" (Environmental Objections)The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection• for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts."EU" (Environmentally Unsatisfactory)The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).	Your comment regarding the EPA rating system is noted. A comprehensive project-wide monitoring and mitigation plan (COM Plan) will be implemented for this project. The COM Plan will integrate protective measures from the BLM Land and RMPs, Biological Opinion, ACMs, Stipulated Agreements, the DOI Handbook for Adaptive Management, and additional mitigation measures.
38108-23	EPA recommends that BLM design and select a preferred alternative ROW, that would, at minimum, avoid and minimize adverse impacts to the most vulnerable surface and groundwater resources, especially those in regionally significant spring complexes located in Spring and Snake Valleys and Great Basin National Park, those affecting tribes, and those associated with areas designated to protect rare plant communities and protected species.	Please refer to standard resource responses Gen-3 and Gen-5 for information on this topic.
38108-24	EPA appreciates the opportunity to provide input on this ROW and groundwater development project. We would welcome the opportunity to work with BLM, SNW A and other resource agencies to develop an approach that achieves the project purpose/need and maximizes aquatic resource protection.	Thank you for your comment. The subject of this comment is beyond the Draft EIS scope and does not require further agency response. However, your comment topic will be considered by the BLM during preparation of the Final EIS and Record of Decision.
38108-25	EPA appreciates the opportunity to provide input on this ROW and groundwater development project. We would welcome the opportunity to work with BLM, SNW A and other resource agencies to develop an approach that achieves the project purpose/need and maximizes aquatic resource protection.	Data entry error - comment was repeated.

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38108-26	Long-term irreversible flow reductions and drying up of perennial water sources (p. 3.3-113, p. 4-2). The DEIS predicts that a decrease or loss of flow to 44 perennial springs, 212 total springs, and 80 miles of perennial streams would occur after 75 years, and to 57 perennial springs, 305 total springs and 112 miles of perennial streams after 200 years.	The DEIS does not predict a decrease of loss of flow to a specific number of springs or miles of stream as stated in the comment. Rather, the EIS analysis identifies the relative risk to springs and miles of perennial streams within the model simulated drawdown area.
38108-27	Long-term irreversible flow reductions and drying up of perennial water sources (p. 3.3-113, p. 4-2). The DEIS predicts that a decrease or loss of flow to 44 perennial springs, 212 total springs, and 80 miles of perennial streams would occur after 75 years, and to 57 perennial springs, 305 total springs and 112 miles of perennial streams after 200 years.	Thank you for expressing your concerns related to the Draft EIS. Your suggestions have been carefully considered by the BLM, but have not resulted in changes to the analyses presented in this document.
38108-28	This change of wetland vegetation to non-wetland vegetation is unlikely to be reversed, since pumping would reduce the source of water that sustains hydric (wetland) soils, resulting in long-term drying of hydric soils that could permanently reduce the ability of these soils to support wetland vegetation (p. 3.4-22). "Because of the very long time frames, and potential vegetation community changes over large geographic areas, the effects are considered irreversible within any reasonable time frame (likely more than 500 years)"(p. 4-2).	Updated sections 3.5 (vegetation) and chapter 4 describe the potential impacts from groundwater pumping. Please review standard resource responses MM-1 and MM-2 for information relevant to this topic.
38108-29	Long-term reductions or compositional change in phreatophytic2 vegetation (p. 4-2). The DEIS predicts that approximately 137,000 acres of basin shrubland will change after 75 years, and 191,500 acres of basin shrubland will change after 200 years (p. 3.5-48).	The purpose of the NEPA (EIS) process is to disclose potential project impacts. The BLM appreciates that you have identified your specific concerns regarding the impacts disclosed in the DEIS.
38108-30	The DEIS states that these vegetation effects "are considered irreversible within any reasonable time frame (likely more than 500 years)"(p. 4-2).	The purpose of the NEPA (EIS) process is to disclose potential project impacts. The BLM appreciates that you have identified your specific concerns regarding the impacts disclosed in the DEIS. Updated sections 3.5 (vegetation) and chapter 4 describe the potential impacts from groundwater pumping. Please review standard resource responses MM-1 and MM-2 for information relevant to this topic.
38108-31	Permanent extraction of groundwater in storage within the aquifers (as evidenced by the formation of regionally extensive drawdown cones) (p. 4-2). The DEIS notes that these impacts would be irretrievable. Using Proposed Action 200 year maps of drawdown areas and Google Earth Pro, we calculated that the area of 10-foot or greater drawdown covers over 5,000 square miles.	Comment noted.
38108-32	Permanent impacts from surface subsidence caused by future groundwater pumping (p.3.2-32). The DEIS estimates that up to 525 square miles could experience subsidence exceeding 5 feet after 200 years (p. 3.2-48) (and 781 square miles cumulatively, p. 3.2-52) for the proposed action. Subsidence can result in damage to roads and highways, fences, buildings, pipelines, canals and utility systems (p. 3.18-69).	Potential impacts related to groundwater pumping have been addressed at a programmatic level in this EIS. Subsequent NEPA will be required to determine and disclose site-specific impacts.
38108-33	Damage can include cracked walls and foundations, warped fences and utility poles, ruptured pipelines, broken canals, and deep fissures through roadways.	Potential impacts related to groundwater pumping have been addressed at a programmatic level in this EIS. Subsequent NEPA will be required to determine and disclose site-specific impacts.
38108-34	Irreversible commitment of resources important to wildlife. The DEIS states that the loss or long-term reduction or degraded quality of wetlands and phreatophytic vegetation would be an irretrievable commitment of resources.	Please review the updated chapter 4 which discusses this topic. Refer also to standard resource responses MM-1 and MM-2 for additional information.
38108-35	This reduction or adverse change in habitat quality could affect habitat carrying capacity, cover, breeding sites, foraging areas, and animal displacement on a long-term basis (p. 4-2).	These potential impacts are disclosed in the FEIS.
38108-36	Long-term impacts to agriculture due to loss of vegetation/forage production. The DEIS identifies long-term risks to the agricultural sector in the rural areas through potential effects on grazing, irrigation and well development costs, and streams and seeps that serve as livestock water supplies (p. ES-60). Of the 730,000 acres of grazing allotments in the region of study, 20% (142,975 acres) could experience plant species composition change after 75 years, and 27% (200,080 acres) could change after 200 years (p. 3.12-42).	For the Proposed Action, allotments within the region of study could experience a transformation from wetland/meadow and basin shrubland vegetation to an upland variety; however, this does not equate to a 20 percent loss of forage vegetation as the change would likely result in some type of grazable vegetation.
38108-37	Livestock could damage remaining water sources (wetland meadows and phreatophyte areas that typically surround them) due to overuse of the remaining available water sources.	Supplemental water sources may be necessary in some allotments where the greatest effects of groundwater drawdown are experienced. These would be strategically placed to avoid overuse of wetland areas.
38108-38	The DEIS states that the reductions to flow or quality of springs and perennial streams would be an irretrievable, and potentially irreversible, loss of water sources for livestock (p. 4-3).	Supplemental water sources may need to be provided for livestock on some allotments.
38108-39	Impacts to water resources within Great Basin National Park (GBNP). The DEIS indicates that Proposed Action pumping could reduce flows in two springs and two streams within the GBNP that contain game fish or nongame native fish species (p. 3.7-46).	The purpose of the NEPA (EIS) process is to disclose potential project impacts. The BLM appreciates that you have identified your specific concerns regarding the impacts disclosed in the DEIS.
38108-40	Potential water quality impacts. The DEIS acknowledges that flow changes can potentially be accompanied by changes in water quality (p. 3.3-113). Based on our professional experience, a new flow regime, as a result of depressurization from increased groundwater drawdown, could lead to intrusion of brackish water from other formations or nearby aquifer systems. Water quality of the regional carbonate aquifer, shallower alluvial aquifers, and surface waters could be adversely affected by an increase in total dissolved solids (TDS).	See response WR-7 and additional text provided in Section 3.3.2.9 regarding potential impacts to water quality.

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38108-41	The proposed project covers an extremely large area consisting of the southern and central portions of eastern Nevada and western portions of Utah. The study area for water resources encompasses 35 hydrographic basins and over 20,000 square miles, an area slightly larger than the combined land area of Maryland, Delaware, New Jersey, and the District of Columbia? More than 5,000 square miles within this area would be subject to groundwater drawdown of greater than 10 feet. The full area of effects of the proposed project can be expected to be even greater. The DEIS used a regional groundwater model with a grid size of 1 kilometer, which is too coarse to accurately simulate effects to springs, surface water features, and vegetation in areas where groundwater is near the surface, thus likely underestimating impacts.	See Standard Comment Response WR-1 regarding the justification for the programmatic level assessment of drawdown effects.
38108-42	In addition, the DEIS does not contain sufficient analysis to characterize the connectivity between the regional carbonate aquifer and basin fill alluvial aquifer.	Additional description was added to Section 3.3.1.5 that indicates that the basin fill and carbonate aquifer systems are closely interconnected.
38108-43	Design and select an alternative that achieves the project purpose and need, maximizes aquatic resource protection, and reduces long-term environmental impacts. Given the severe and irreversible impacts on ecosystems and groundwater supply, and the potential groundwater drawdown air quality impacts cited in the DEIS, EPA recommends that BLM design and select a preferred alternative right-of-way (ROW) that would, at minimum, avoid and minimize adverse . impacts to the most vulnerable surface and groundwater resources, especially those in regionally significant spring complexes located in Spring and Snake Valleys and Great Basin National Park, those affecting tribes, and those associated with areas designated to protect rare plant communities and protected species.	Your comment has been reviewed by the BLM and carefully considered in its choice of the agency preferred alternative presented in this FEIS.
38108-44	We believe that Alternatives D and E, if combined with additional aggressive demand management measures and modified to support only intermittent pumping needed for drought and emergencies, as proposed for Alternative C, would substantially reduce impacts and fulfill Southern Nevada Water Authority's (SNWA) need for an additional water supply.	Your comment is noted regarding Alternatives D and E.
38108-45	We note that the geographical extent of the ROW identified in the Lincoln County Conservation, Recreation, and Development Act of 2004, which is BLM's legislative requirement to grant a ROW, more closely matches that of Alternatives D and E.5	In response to your comment, additional text has been added to the alternative descriptions in Chapter 2.
38108-46	Conduct additional analysis to better characterize and predict large-scale long-term impacts. Below, we identify information needs which we believe are important for informed decision-making.6	This comment should not have been bracketed separately. Responses to the individual suggestions for further analysis are listed below.
38108-47	Characterize the carbonate aquifer interactions with alluvial aquifers and develop local groundwater flow models. Prior to the approval of any groundwater extraction, EPA re~ommends the BLM conduct additional investigations (e.g., aquifer testing, monitoring well installation and sampling, geochemical and water quality analysis) to better characterize the deep carbonate aquifer and its interactions with shallower aquifers in the affected region.	The monitoring and mitigation for this project is complex and extensive. The BLM is looking at two separate processes for the development of the monitoring and mitigation plans for this project. Currently, there are stipulated agreements which have been developed through the Nevada State Water Engineer that BLM contributed to. BLM also manages surface and mineral resources for federal lands it administers under FLPMA and BLM has developed a project-wide COM Plan to protect federal resources that may be impacted by construction, operation, maintenance and abandonment of the project related facilities (see revisions to Section 3.20). This section outlines the process that BLM will follow, now and in the future, for mitigation for this project. Mitigation related to groundwater development will be included in subsequent NEPA and associated valley-specific COM Plans as described in Section 3.20. The BLM project-wide plan also identifies potential additional monitoring and data collections that need to occur for future NEPA analysis.All comments on the stipulated agreements have been provided to the executive committee overseeing the implementation of those agreements.
38108-48	We also recommend developing local groundwater flow models, when appropriate, to better predict the impacts of regional groundwater extraction on specific groundwater and surface water features.	See Standard Comment Response WR-1 regarding groundwater modeling for the programmatic analysis.
38108-49	Identify nearby saline aquifer systems. Existing saline aquifer systems that have the potential to be hydrologically connected to the carbonate aquifer should be identified throughout the project area to identify potential water quality issues, especially in areas where groundwater extraction may have effects on flow regimes which could lead to impacts to water quality. Suggestions for gathering this information include the following: If data are not currently available, conduct open hole (including gamma ray) logs to better understand the geology and water chemistry. These logs can assist with defining semi-confining units in the strata. Pickett Plot analysis (cross plot/pattern recognition of Archie Equation);6 can provide a basic appraisal of the water's sodium chloride (NaCl) equivalency, which is often comparable to TDS; Investigate availability of Department of Energy geologic sequestration surveys for the project area. These surveys specifically identify saline aquifers.	See comment response WR-7 regarding impacts to water quality.

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38108-50	Develop a regional groundwater framework for use of the regional carbonate aquifer. We urge the Bureau of Land Management (BLM) to work with Cooperating Agencies, Nevada State Engineer, SNWA, and other water right applicants to build on current regional groundwater studies7 to develop a collaborative regional groundwater management framework to guide groundwater use to ensure: 1) efficient long-term sustainable use of the alluvial and deep carbonate-rock aquifers, and 2) avoidance of adverse impacts to third parties and surface and groundwater quality and quantity. For example, the management framework could define a regional groundwater coordination and collaboration process to address use of interconnected aquifers, public participation in groundwater use decisions, and research needs. The Final EIS (FEIS) should identify any efforts that are occurring towards these goals.	BLM has no role in the management of Nevada water rights, this is the role of the NSE. However, BLM is a party to water rights stipulated agreements in Spring, Delamar, Dry Lake and Cave valleys. Therefore, we have forwarded your comment to the executive committee who oversees the development and implementation of activities under these stipulated agreements. We have also provided a copy of your comment to the Nevada State Engineer, who does have statutory authority to define a management framework for regional groundwater coordination, insure efficient long-term sustainable use of underground aquifers, avoid impacts to third party water rights holders and provide for water quality and quantity.
38108-51	The DEIS and its appendices identify various mitigation measures, including Best Management Practices (BMPs) from the BLM Ely District's Management Plans that are applicable to the project; applicant-committed environmental protection measures• that SNWA has agreed to; and additional mitigation measures that were developed for specific resources (p. ES-20).	This text should not have been bracketed as a comment.
38108-52	Many of the applicantcommitted environmental protection measures, contained in Appendix A of the Conceptual Plan of Development (Appendix E of the DEIS), address impacts during the construction phase.	This text should not have been bracketed as a comment.
38108-53	Regional waterrelated effects from groundwater pumping are addressed via existing agreements, including the stipulated agreements between Department of Interior agencies and SNW A, and via an adaptive management plan.	This text should not have been bracketed as a comment.
38108-54	Based on the summary included on pages A-38 through A-45 of the Conceptual Plan of Development Appendix A, the measures included in the stipulated agreements largely address monitoring, data sharing, and reporting.	This text should not have been bracketed as a comment.
38108-55	The adaptive management plan (p. A-46) provides a framework for the adaptive management strategy and, in addition to the monitoring and reporting specified in the stipulated agreements, identifies environmental goals, introduces the concepts of environmental indicators and early warning thresholds, and discusses implementation of the adaptive management plan, which sets out a process by which BLM will consider adaptive management measures to mitigate observed effects.	This text should not have been bracketed as a comment.
38108-56	Our concerns regarding the adaptive management plan are: (1) the lack of specific ecosystem health objectives and disclosure of the levels of impact that would be deemed acceptable and allowed to remain; and (2) lack of an assessment of the probable effectiveness of the mitigation strategy, as a whole, in preserving key environmental amenities and ecosystem functions regionally.	See Standard Resource Responses MM-1 and MM-2.
38108-57	The DEIS acknowledges permanent unmitigable impacts. The DEIS states that groundwater development presumes some level of change to vegetation (p. 3.3-121), air quality (p. 3.1-37), and a significant reduction in groundwater levels in parts of Snake Valley. Therefore, not all impacts would be avoided by the 3M (mitigation) plan (p. 3.3-121, 3.5-47).	The purpose of the EIS is to disclose all potential impacts. Not all impacts can be mitigated. Please see standard resource responses MM-1 and MM-2 for more information on this topic.
38108-58	The DEIS also states that considering the regional scale of the predicted drawdown and number of perennial water sources identified that could be affected, mitigation may not be feasible or available for all locations (p. 3.3-122).	Under FLPMA, BLM's requirement is to prevent undue and unecessary degradation of public lands and resources. Please refer to standard resource responses Gen-8, MM-1 and MM-2 for information relevant to this comment.
38108-59	It is not clear what magnitude or extent of impact will be permitted, as the environmental goals of the adaptive management plan are very vague and do not define what constitutes an "unreasonable adverse effect."	Impact thresholds will be included in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan) for this project. See Standard Resource Responses MM-1 and MM-2.
38108-60	The stipulated agreements imply that no effects at all will be allowed on Federal Resources within Great Basin National Park, and no "unreasonable adverse effects" to Federal Resources elsewhere (p. 12 of 14, Exhibit A of Stipulation for Spring Valley).	Language in the Stipulated Agreements does not state that no impacts would be allowed. See Standard Resource Responses MM-1 and MM-2.
38108-61	Because some level of change to vegetation will be allowed (and perhaps facilitated by a potential adaptive management measure to conduct large-scale seeding to assist in vegetation transition, p. A-56), it is important to convey what scale of landscape conversion will be permissible.	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2. Additionally, large scale seeding has been recommended as a general mitigation measure to offset potential impacts of the proposed project. Additional analyses will be performed during subsequent NEPA to address specific areas with specialized plant communities and specific soil conditions.
38108-62	Additionally, NEPA requires that an EIS discuss mitigation measures with "sufficient detail to ensure that environmental consequences have been fairly evaluated."8 An essential component of this discussion is an assessment of whether the proposed mitigation measures can be effective.9 We acknowledge that the DEIS attempts to convey effectiveness of each proposed mitigation measure and the residual impacts that would occur after mitigation.	Please refer to standard resource responses MM-1 and MM-2 for information on this topic.
38108-63	However, the DEIS does not evaluate the probable effectiveness of the mitigation strategy, as a whole, in preserving regional ecosystem functions. Because of the large magnitude and scale of potential impacts, it is critical that an evaluation of regional mitigation effectiveness be included in the programmatic-level impact assessment and not deferred to future tiered NEPA analyses.	Mitigation effectiveness will be included in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan) for this project. See Standard Resource Responses MM-1 and MM-2.

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ID	Comment	Response
38108-64	The adaptive management plan defers future decision-making regarding impact assessment and mitigation to the personnel comprising the technical working groups, which must reach consensus, and to an executive committee which, if no consensus is reached, can appeal to the Nevada State Engineer's Office. The effectiveness of this dispute resolution process in ensuring mitigation measures are implemented is not clear or discussed. There do not appear to be binding commitments on the parties to ensure a certain level of mitigation occurs or habitat function is maintained if disagreements cannot be resolved.	The effectiveness of concensus resoluation will be included in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan) for this project. Please see standard resource responses MM-1 and MM-2 for additional information.
38108-65	The adaptive management strategy and plan should be further developed. There should be a clear articulation of the minimum desired environmental conditions to be preserved in the project areas, perhaps drawn from goals present in the Ely District's Resource Management Plan, as well as a discussion of the impacts that will be allowed to remain, expressed in terms of large-scale habitat•and ecosystem functioning.	A comprehensive project-wide monitoring and mitigation plan (COM Plan) will be implemented for this project. See Standard Resource Responses MM-1 and MM-2.
38108-66	The FEIS should include an evaluation of the adaptive management plan and the likelihood that minimum desired environmental conditions can be achieved with the adaptive management plan as outlined in the DEIS (Appendix A of Appendix E and in the stipulated agreements).	See Standard Resource Responses MM-1 and MM-2.
38108-67	Assessment of the local and regional effectiveness of the adaptive management plan should be consistent with Council on Environmental Quality (CEQ) guidance that states that "to ensure that environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented must also be discussed." 10	Mitigation effectiveness will be included in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan) for this project. See Standard Resource Responses MM-1 and MM-2.
38108-68	Expand the mitigation/adaptive management plan to include the entire project area.	See Standard Resource Responses MM-1 and MM-2. The COM Plan will be applied to the entire project area where impacts were predicted.
38108-69	Identify the environmental indicators that were selected for monitoring from the Spring Valley and Delamar, Dry Lake, and Cave Valley's biological and hydrologic monitoring plans (p. A-49).	Environmental indicators will be included in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan) for this project. See Standard Resource Response MM-1.
38108-70	Identify specific management decision points which would trigger action, including management alternatives and mitigation measures that would be implemented should a threshold be exceeded. Appropriate decision points could include observed ecologically harmless reductions in spring flows or wetland vegetation. The commitments to specific mitigation actions should be clearly identified in the adaptive management plan.	Impact thresholds or triggers will be included in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan) for this project. See Standard Resource Response MM-1.
38108-71	Identify funding sources for the long-term mitigation and adaptive management plan.	Based on this comment, text has been added to the EIS. Also, please see Standard Resource Response MM-1.
38108-72	Identify mechanisms for public disclosure of the analysis and management decisions.	Mechanisms for public disclosure will be included in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan) for this project. See Standard Resource Response MM-1.
38108-73	Describe the roles of BLM, other local, State, and federal agencies, the public and other stakeholders in the adaptive management process.	The roles of the BLM and other agencies will be defined in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan) for this project. See Standard Resource Response MM-1.
38108-74	Implement additional monitoring to ensure the following are included: Spring and surface water flow monitoring; Additional aquifer testing with monitoring wells located in the alluvial and carbonate aquifers, with monitoring of surface water response; Geochemical and water quality analysis of surface water, alluvial groundwater and carbonate bedrock groundwater to help determine interconnection between aquifers; o Installation of shallow piezometers to monitor shallow groundwater near springs, seeps, streams, and active evapotranspiration (ET) areas; Deeper piezometers or monitoring wells to monitor fault or fracture flow if fault or fracture flow is the source of surface water.	Please see standard resource responses MM-1, MM-2 and MM-3 for information on this topic.
38108-75	Ecological monitoring to assess population and health of plant and animal species dependent on surface water features.	Please refer to standard resource response MM-1 for information concerning this comment.
38108-76	The DEIS estimates substantial windblown fine and coarse particulate emissions11 that could occur as a result of change and/or loss of vegetation coverage due to groundwater pumping. While the DEIS makes no statement as to the significance of these emissions, EPA believes it is possible that these emissions could have significant impacts on local and regional air quality. However, because no air quality modeling was performed, no conclusions can be made regarding the severity of these emissions in relation to the National Ambient Air Quality Standards (NAAQS) for particulate matter 10 microns or less (PM10), or for particulate matter 2.5 microns or less (PM2.5). A thorough analysis of air quality impacts is essential because of the magnitude of these emissions and their potential to affect public health in communities in and near the project area.12	Please see standard resource responses Air-7 and Air-9.
38108-77	These emissions also could interfere with the ability of Provo, Salt Lake County, and Ogden City, Utah, as well as Clark County, Nevada, to attain the PM10 and PM2.5 National Ambient Air Quality Standards (NAAQS). Portions of these areas are currently not meeting these health-based standards for PM10, and/or PM2.5 .	Please see common response Air-14.

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ID	Comment	Response
38108-78	EPA believes that the air quality analysis is insufficient to evaluate and disclose potential impacts to air quality and public health.	Please see standard resource responses Air-7 and Air-9.
38108-79	Additionally, EPA disagrees with the DEIS' conclusion that particulate matter will decrease significantly during downwind transport and that only a very small fraction of wind erosion emissions from the cumulative project area is expected to be transported into Salt Lake County, Utah (p. 3.1-60). Under high wind conditions, dust plumes extending more than 100 miles are not uncommon in this region, and are readily visible on satellite imagery.13 Therefore, significant increases in disturbed soil areas 75 to 100 miles west and southwest of the Provo, Ogden City, and Salt Lake County nonattainment areas have the potential to increase the frequency and severity of high wind NAAQS violations. The severity of such events has already, on one occasion, reached the significant harm level for PM10 (PM10 of 605 !Jg/m3 on March 30, 2010, in Salt Lake County).	Please see standard resource responses Air-7, Air-8 and Air-14.
38108-80	Conduct a quantitative modeling analysis and compare results to the NAAQS to provide a complete assessment of project air quality impacts. We believe this information is needed now and should not be deferred to subsequent tiered NEPA documents. A quantitative modeling analysis would provide the BLM the ability to accurately disclose air quality impacts, including cumulative impacts, and to inform mitigation. We recommend the modeling analysis include the Wasatch Front area because of the history of PM10 and PM2.s exceedances caused by windblown dust from areas west of Salt Lake City.	Please see standard resource responses Air-7 and Air-9.
38108-81	Refine the emissions estimates by establishing an appropriate site-specific emissions factor. The particulate emissions predicted in the DEIS are high, yet may contain significant uncertainty. We understand that no emissions factor exists for estimating emissions from this source (loss of vegetative cover as a result of dewatering) and that BLM used the most applicable emissions factors. However, we believe an emission factor could be developed based on site-specific geologic conditions that would generate a more accurate emissions estimate for use in the air quality model.	Please see standard resource response Air-21.
38108-82	We recommend BLM's air quality analysts consult with windblown dust experts from the Nevada research community, for example, experts from the University of Nevada, and/or Clark County, whom we are aware have done extensive wind-blown dust studies, to develop site-specific emissions factors.	Please see standard resource response Air-21.
38108-83	Document analytical approach in Air Quality Modeling Protocol. EPA recommends that the approach used to analyze and predict air quality impacts be documented in an Air Quality Modeling Protocol. This Protocol would provide a "roadmap" for how the air analysis would be conducted and the results presented, describe the model to be used, model settings, modeling boundaries, and important model inputs such as meteorology, background data, and emission inventories. The Protocol should consider potential increases in frequency and/or intensity of wind events resulting from climate change. The Protocol should also generally describe the standards and thresholds to which the air impact results will be compared. We recommend that a Draft Air Quality Modeling Protocol be circulated among the relevant stakeholders, including EPA, for comment and discussion.	Please see standard resource responses Air-7.
38108-84	Site a particulate matter monitoring location between project area and Salt Lake City. We recommend at least one of the particulate matter monitoring locations be sited in a location between the project area and Salt Lake City, Utah, in consultation with EPA and the Utah Division of Air Quality.	Please see common responses Air-12 and Air-13.
38108-85	Identify and Commit to Implementation of Mitigation Measures. EPA recommends BLM ensure implementation of reasonable mitigation and control measures and design features through all appropriate mechanisms. We suggest inclusion of a list of mitigation measures that BLM could apply in the event future air quality monitoring shows there to be an adverse impact to air quality in or nearby the project area as a result of groundwater pumping.	Please refer to standard resource responses MM-1 and MM-2 for information on this topic.
38108-86	As stated above under "Impacts on Groundwater Resources," we are very concerned with the magnitude of predicted impacts on wetlands and meadows, and on hydric soils as a result of groundwater pumping. Hydric soils are formed under conditions of water saturation, flooding, or ponding, and are commonly associated with riparian areas, wetlands, springs, and seeps. Hydric soils are rare in the region due to the arid climate (p. 3.4-6).	Thank you for expressing your concerns related to the Draft EIS. Your suggestions have been carefully considered by the BLM, but have not resulted in changes to the analyses presented in this document.
38108-87	Because the project construction is expected to involve the discharge of fill into jurisdictional waters of the U.S., the DEIS acknowledges that a Clean Water Act (CWA) Section 404 permit will be required (either Nationwide or Individual permits, p. 1-10). EPA believes that the direct, indirect and cumulative impacts to aquatic resources warrant the evaluation of this project under an Individual permit process pursuant to CWA Section 404. We do not believe a Nationwide permit is appropriate for this ROW project.	The comment on Corps of Engineers's 404 permitting requirements is noted.

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ID	Comment	Response
38108-88	Permit applicants must comply with EPA's CWA Section 404(b)(l) Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials (40 CFR Part 230)(Guidelines). As proposed, the project will likely result in significant degradation to waters of the U.S., could violate water quality standards, may result in jeopardy of endangered species, and may not be mitigable- each an independent criterion under the 404(b)(l) Guidelines that would prohibit issuance of a Section 404 permit. Under the Guidelines, the U.S. Army Corps of Engineers (Corps) cannot permit a discharge of dredged or fill material into waters of the U.S. that is not the least environmentally damaging practicable alternative (LEDPA).	Impacts to waters of the U.S. and aquatic resources are disclosed in the EIS. Alternatives evaluation for compliance to the 404(b)(1) guidelines is a separate process under the 404 permit review.
38108-89	Additionally, regulations require a mitigation plan consistent with the Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (40 CFR Part 230). The mitigation measures discussed in the DEIS and stipulated agreements are primarily monitoring measures. Compensatory mitigation for lost acres of waters of the U.S. may be needed. Such losses may, in fact, be unmitigable, given the potential need for thousands of acres of created waters of the U.S. and compensatory wetlands.	Thank you for your comment. Please see Standard Resource Response MM-1. Compensation mitigation will be considered as part of the mitigation planning for the project.
38108-90	Select a preferred alternative that fulfills the project purpose and need with fewer long-term environmental impacts. For example, Alternative D predicts wetlands impacts at just over a quarter of the acreage compared to the Proposed Action after 7 5 years of pumping. Modification of this alternative to include additional aggressive demand measures and to support only intermittent pumping, could further reduce these impacts.	Thank you for expressing your concerns related to the Draft EIS. Your suggestions have been carefully considered by the BLM, but have not resulted in changes to the analyses presented in this document.
38108-91	Seek an Individual Permit. The BLM and project proponent should seek an Individual CW A Section 404 permit. The FEIS should describe the status of the CW A Section 404 permit application and consultation with the Corps and include:	The BLM and project proponent are seeking an Individual Section 404 permit.
38108-92	Findings of the official jurisdictional determination. An official jurisdictional determination of the extent of Waters of the United States (waters) subject to Section 404 of the CW A has not been verified by the Corps.	Wetland delineations have not been conducted along the proposed right-ofway, and official juridictional determinations have not been requested. Additional analyses will be performed during subsequent NEPA to address specific areas with specialized plant communities and specific soil conditions, such as wetlands. Please review section 3.5 (vegetation) for updated information on wetland requirements.
38108-93	Demonstration of compliance with the Guidelines. The FEIS should include an analysis demonstrating compliance with EPA's 404(b)(l) Guidelines (40 CFR 230).	Impacts to waters of the U.S. and aquatic resources are disclosed in the EIS.
38108-94	A mitigation plan consistent with the Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (40 CFR Part 230).Aquatic Biological Resources.	Thank you for your comment. Please see Standard Resource Response MM-1. Compensation mitigation will be considered as part of mitigation planning for the project.
38108-95	The analysis of impacts to aquatic habitat from groundwater pumping in the DEIS focused on perennial springs and streams located within the 10-foot drawdown contour (p. 3.7-34). Consequently, it does not fully address the ephemeral and intermittent aquatic systems that are critical to the health and stability of arid ecosystems, especially in the Mojave and Great Basin Deserts. Because of this omission, we believe the assessment of impacts to aquatic biological resources is incomplete.	Ephemeral and intermittent streams were not included in the pumping effects analysis, since their source of water is not connected to groundwater. The analysis does include perennial streams that contain some intermittent reaches.
38108-96	Identify and evaluate impacts to all aquatic biological resources, including those utilizing ephemeral and intermittent systems. The FEIS should expand the aquatic biological resources evaluation to capture potential effects on the habitat of the many ephemeral and intermittent streams and washes. We recommend adding these intermittent and ephemeral habitats to the impact indicators and quantifying these impacts in Table 3.7-18. We recommend taking an ecosystem approach in the effects analysis that stresses the relationships between organisms and their environment. Include a narrative that provides a clear picture of how watersheds and ecological conditions would shift over the life of the project.	Ephemeral and intermittent strweams were not included in the pumping effects analysis. since their water source is not connected to groundwater. Perennial streams were included in the analysis that contain intermittent reaches.
38108-97	ROW Construction EffectsWhile the most significant adverse impacts will occur as a result of long-term groundwater extraction, there will also be direct impacts resulting from pipeline construction and construction of well pads, distribution pipelines and electrical transmission lines. EPA has the following recommendations for reducing or avoiding impacts from ROW construction and operation and improving the analysis and disclosure of impacts in the FEIS.	This text should not have been bracketed as a comment. No response is necessaryt.
38108-98	Evaluate effects from construction support areas and construction water supply pumping. Construction support areas and related areas could have significant impacts, such as the proposed construction support area adjacent to Lower Meadow Wash near Caliente (p. 3.7-22). Construction would also require one water supply well every 10 miles with the capability of delivering between 5.5 and 8.7 million gallons of construction water for each pipeline mile (p. 3.3-74). The DEIS does not disclose the potential effects of this construction pumping on groundwater, wetlands and aquatic resources since it defers identification of these effects to a future Construction Water Supply Plan (p. 3.3-74).	Construction water use is discussed in the DEIS for aquatic biological resources on page 3.7-26.
38108-99	The FEIS should state whether pumping for the construction water supply was included in the existing groundwater modeling and projected impacts to water and aquatic biological resources.	Construction water supply requirements are discussed and evaluated for each alternative. For example, see Section 3.3.2.2 under the heading "Construction Water Supply" and mitigation measures ROW-WR-3 Construction Water Supply Plan.

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ID	Comment	Response
38108-100	Use existing ROWs to avoid and minimize new disturbance. The DEIS assesses the potential environmental effects of four localized ROW alignment options. Each option involves a selected segment of the main pipeline or power line alignments, and alignment within existing transportation utility corridors to reduce new disturbance (Table 2.10-5, p. 2-121). When selecting a preferred alignment, EPA recommends use of existing transmission lines and utility corridors whenever possible to avoid and reduce new disturbance, especially effects on water and aquatic resources and areas of special concern.	Your comment has been reviewed by the BLM and considered in its choice of the agency preferred alternative presented in this FEIS.
38108-101	Expand the dust control measures and ensure implementation occurs across the entire project area. The DEIS references requirements for a Dust Control Plan that details dust suppression methods to reduce emissions (p. 3.1-19). Given the projected substantial PM10 and PM2.5 emissions, the FEIS should include specific assurances that the Dust Control Plan would be implemented across the entire project area, not just within the Clark County, Nevada nonattainment area.	The BLM does not have the authority to require that the dust control plan developed for Clark County be implemented throughout the project area; however, the BLM must review and approve of the proponent's dust control measures prior to issuing a notice to proceed.
38108-102	Avoid further impacts to CWA Section 303(d) listed waterbodies. The proposed project presents a variety of unquantified threats to the quality of waters found throughout the study area. Shortterm threats include those associated with potential erosion and other construction-related impacts from what is likely to be a lengthy, multi-phased project buildout. The Muddy River, Trout Creek, Cottonwood Creek, Hay Meadow Reservoir, Nesbitt Lake, Echo Canyon Reservoir, Cold Springs Reservoir, Duck Creek and Comins Reservoir are on the CWA Section 303(d) list as impaired waterbodies. The FEIS should demonstrate that the proposed project will not further impair the above waterbodies and will not increase pollutants from stormwater runoff, nuisance flows and groundwater drawdown.	Potential construction related effects to these water bodies are addressed in Section 3.7.
38108-103	Modify project elements to avoid Areas of Critical Environmental Concern. As currently designed, project elements would be located in the BLM Coyote Springs Area of Critical Environmental Concern (ACEC) and the Kane Springs ACEC, both of which were designated to protect the desert tortoise (p. 3.14-4). We recommend BLM work with SNWA on project design modifications to avoid the potential adverse effects of the project components on these ACECs.	Thank you for your comment. Please see Standard Resource Response MM-1. Additionally, mitigation measure ROW-SD-1 is intended to capture the central concern that underlies this comment.
38108-104	Develop spring flow mitigation measures that avoid contributing to the drawdown impact. Proposed mitigation for reduced groundwater flows to Shoshone Ponds in Spring Valley is to improve an existing well or drill a new well to pump water from the same aquifer to maintain the flow to the ponds. This mitigation measure would cause an incremental increase in groundwater drawdown (p. 3.3-121). EPA recommends avoidance of the adverse impact through reduced pumping, relocation of water supply diversion wells, or other feasible measures that will not contribute to the underlying groundwater drawdown impact.	Thank you for your comment. Please see Standard Resource Response MM-1.
38108-105	Section 3.1 of the DEIS estimates the quantity of water delivered via the proposed pipeline and the corresponding amount of energy required for each alternative. Using Alternative A as an example, the DEIS estimates it will take 74.4 continuous megawatts of power to deliver 114,000 acre-feet per year of water (p. 3.1-39). This equates to an energy intensity of 17,500 kilowatt hours per million gallons (kWh/MG). For comparison, Electric Power Research Institute (EPRI) estimated national averages for energy intensity ranging from 700 to 1,800 kWh!MG, depending on water use and customer sector. This would make the water delivered by the proposed project ten to twenty five times more energy intensive than the national average. Even when compared to southern California, known for the high energy intensity of its water supply at 8,900 kWh!MG, the proposed project is nearly twice as energy intensive. 15 The DEIS indicates power requirements associated with operation of the pipeline could be partially offset by electricity generation from hydro-turbines at pressure reducing stations and solar panels to the maximum extent possible, but does not commit to these emission reductions.Greenhouse gas (GHG) emissions estimates are provided in Section 3.1 for indirect emissions associated with the electricity necessary to operate the proposed project (p. 3.1-34). These estimates are based upon the electricity necessary for pumping and ancillary equipment associated with extraction and transportation of groundwater to the Las Vegas area. They do not appear to include indirect GHG emissions associated with the power necessary to operate the water treatment (107 million gallons per day) and wastewater treatment plant(s). Similarly, the GHG emissions estimates do not appear to include the power necessary for: (1) providing the treated water locally via the existing water distribution system, or (2) collecting the resulting wastewater for treatment and final discharge.	Please see common response Air-19 and Air-22.
38108-106	A GHG emissions estimate is provided for construction-related emissions, including pipeline, power line and facilities construction, and construction transportation and maintenance vehicles (Table 3.1-8, p. 3.1 17). These estimates do not appear to include consideration of: (1) worker commuting, which can be considerable for linear developments such as pipelines and power lines, or (2) pumping of groundwater for use during construction.	Please see common response Air-19 and Air-22.
38108-107	Commit to power sources that reduce GHG emissions. EPA recommends that the project design incorporate hydro-turbines and other renewable energy sources to off-set emissions from electricity generation needed to power the project. The FEIS should describe and commit to all feasible measures that will reduce GHG emissions.	Please see common response Air-19. Importantly, the use of renewables to power the project is not within the BLM's purview, but the project proponent plans to include solar power and hydroelectric power sources as part of the project.

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ID	Comment	Response
38108-108	Discuss GHG emissions of linked activities. The discussion of GHG emissions should acknowledge emissions from worker commuting, pumping of groundwater for use during construction, and the emissions from water treatment, distribution, and wastewater collection, treatment, and disposal.	Please see common response Air-19 and Air-22.
38108-109	At least 13 tribes have expressed concerns regarding impacts to water resources, including concerns about the loss of water and tribal water rights, springs drying up or experiencing reduced flow, and the impacts to plants and animals of subsistence and cultural importance. The DEIS indicates that tribes feel that threats to the viability of the springs and everything that relies on them would affect the entire basis for the Native American culture in the Great Basin (p. 3.17-19). We are aware that the Ely and Duckwater Shoshone Tribes have filed protest in the pending Nevada State Engineer water rights hearings, and the Confederated Tribes of the Goshute Reservation submitted resolutions in opposition of the project to both BLM and the Nevada State Engineer, as has the National Congress of American Indians, and the Intertribal Council of Nevada which represents 26 tribes in Nevada.	Thank you for your comment. Tribal comments have been addressed though government-to-government consultation as well as in this document.
38108-110	The analysis in the DEIS with regard to Indian Tribes does not appear to have fully considered the unique characteristics of tribal communities that might render the forecasted flow reductions in springs and streams more significant to this population. It concludes that impacts to water resources would affect Native American traditional values, "but that given the regional scale of the predicted drawdown, and the number of identified water sources that could be affected, it may not be feasible to effectively mitigate impacts to all of the potentially affected water sources" (p. 3.17 -19).	The FEIS addresses these issues conceptually on a programmatic basis, please see section 3.17. Ongoing consultation under section 106 of the NHPA and the progammatic agreement (see updated section 3.16 and 3.17 and appendix F3.16) would address these issues more specifically during subsequent NEPA since they apply to the goundwater pumping aspects of the project.
38108-111	Additionally, the DEIS states that the effectiveness of mitigation measures on potential effects on Native American traditional values is unknown (3.18-70).	Mitigation effectiveness will be included in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan) for this project. See Standard Resource Response MM-1.
38108-112	Characterize pumping effects on tribal drinking water security, patterns of subsistence gathering, and tribal communities. The FEIS should make a greater effort to characterize the project's groundwater pumping effects in relation to drinking water security and tribal patterns of subsistence consumption offish, vegetation, or wildlife (CEQ 1997, p. 3).16 The analysis should include an evaluation as to whether traditional uses and trust resources are affected, and the nature and degree of impact on the physical and social structure of the community (CEQ 1997, p. 9), based on input received during BLM's government-to-government consultations. Additional resources and methodologies are available to assist in this analysis. 17	The FEIS addresses these issues conceptually on a programmatic basis, please see section 3.17. Ongoing consultation under section 106 of the NHPA and the progammatic agreement (see updated section 3.16 and 3.17 and appendix F3.16) would address these issues more specifically during subsequent NEPA since they apply to the goundwater pumping aspects of the project.
38108-113	The FEIS should also identify additional mitigation measures to address tribal impacts.	Mitigation measures, such as tribal monitors, have been proposed in the DEIS and are outlined in the PA. Additional mitigation measures may be identified through continued government-to-government consultation currently ongoing between the BLM and federally-recognized tribes.
38108-114	Construction of the main pipeline ROW and associated groundwater development and pumping is intended to support projected growth in the Las Vegas region, as well as greater stability of the water supply for the existing population of that region, in the face of drought and climate change. Due to uncertainties regarding the pereimial yield of the groundwater basins, interconnection with other hydrographic basins, and the effects of changing climate and drought, as well as the magnitude of the adverse environmental impacts that would result from the proposed project, it makes sense that water conservation and water use efficiencies- key components of supply and demand management- are explored and implemented prior to development of irreplaceable groundwater resources. Innovative and aggressive water supply and demand management is essential in assuring a long-term, sustainable balance between available water supplies, demand, and ecosystem and public health.	This information will be provided to SNWA for their use in future water resource planning.
38108-115	Allocate project water only after implementation of integrated supply and demand management program. We recommend the FEIS demonstrate that all reasonable measures to address the Las Vegas region's demand for water have been explored, and that a comprehensive and integrated demand management program, including water conservation, efficiency, and reuse components, has been, or will be, implemented. For instance, full cost pricing, metering, impact fees, and gray water reuse are all areas that SNW A should consider to reduce water usage. Although we recognize that the Las Vegas region has made great strides in water conservation in recent years, the DEIS does not discuss the quantity of water that may still be available as a result of additional water conservation measures. EPA believes innovative and aggressive water supply and demand management is essential in assuring a long-term, sustainable balance between available water supplies, demand, and ecosystem and public health, and should be considered during decision-making regarding development of new water sources.	The draft and final EIS included the SNWA Water Plan (2009) which discusses their current actions and future plans regarding the topics brought forth in your comment. The BLM has considered your comment and the information in the SNWA Water Plan in its choice of the agency preferred alternative presented in this final EIS. The information in this comment will be provided to SNWA for their use in future water resource planning. Refer also to Standard Resource Responses GEN-3 and SocEcon-2 for additional information.

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ID	Comment	Response
38108-116	Describe water use efficiency, conservation, and reuse management measures to maximize efficient use of scarce water supplies. We recommend a list of feasible supply and demand management measures, such as full cost pricing, comprehensive metering, development impact fees, and gray water reuse, be provided in an appendix to serve as a resource for SNWA, Clark and Lincoln Counties, as well as other users of the carbonate-rock aquifer, the Nevada State Engineer, and water right applicants who wish to maximize the efficient use of scarce water supplies. Aggressive supply and demand management measures have been shown to significantly reduce per capita water use. This appendix could describe the full range of tools available to water users to improve water quality and reuse, maximize water use efficiencies, balance supply and demand, and avoid and minimize adverse effects to third parties, the environment, and other beneficial uses.	The draft and final EIS included the SNWA Water Plan (2009) which discusses their current actions and future plans regarding the topics brought forth in your comment. The BLM has considered your comment and the information in the SNWA Water Plan in its choice of the agency preferred alternative presented in this final EIS. The information in this comment will be provided to SNWA for their use in future water resource planning. Refer also to Standard Resource Responses GEN-3 and SocEcon-2 for additional information.
38108-117	Describe links between water use, urban development, infrastructure, and water policy. Consider integration into project design and management. Efficient water use can be enhanced through development design, infrastructure, and drinking water policies. We recommend the FEIS discuss the linkages between water use and these factors and describe potential mechanisms to support water use efficiencies. We recommend the FEIS provide a short discussion of who could best implement the identified mechanisms. The following reports may be of assistance as a starting point for the evaluation: Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies. EPA Publication 230-R-06-001, EPA National Service Center for Environmental Publications, (800) 490-9198 or nscep@bps-lmit.com.Protecting Water Resources with Higher-Density Development. EPA publication 231-R-06-001. EPA National Service Center for Environmental Publications, (800) 490-9198 or nscep@bpslmit.com.	The draft and final EIS included the SNWA Water Plan (2009) which discusses their current actions and future plans regarding the topics brought forth in your comment. The BLM has considered your comment and the information in the SNWA Water Plan in its choice of the agency preferred alternative presented in this final EIS. The information in this comment will be provided to SNWA for their use in future water resource planning. Refer also to Standard Resource Responses GEN-3 and SocEcon-2 for additional information.
Fish and Wildlife Service		
35028-1	We anticipate working with BLM on these issues during section 7 consultation, which will include considerations for the federally-listed desert tortoise and several technical assistance species (e.g., greater sage-grouse). Additionally, we anticipate meeting with the Southern Nevada Water Authority (SNWA) and BLM in the near future to discuss migratory bird and bald and golden eagle issues. These meetings may result in recommendations to add measures (or modify existing applicant committed measures) in order to avoid, minimize, or mitigate adverse effects to these species.	Since the release of the DEIS, the BLM has initiated formal Section 7 consultation to address potential impacts to listed species. A Biological Assessment was provided to the FWS in May 2012 and this assessment includes analysis of the GWP Project relative to listed species. The BLM has had several meetings with the FWS regarding Section 7 consultation and will continue to meet as needed until the Biological Opinion is finalized. With regard to migratory bird and bald and golden eagle issues, SNWA has met with the FWS to discuss conformance with the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). The SNWA has committed to completing a bird conservation strategy to address these issues.
35028-2	Magnitude of the Proposed Groundwater Development The magnitude of the proposed groundwater withdrawal is large compared to the rate of recharge in the project basins (rate of natural replenishment). Consequently, the GWD Project is likely to result in widespread and substantial declines in groundwater levels within the project basins and significant declines in groundwater levels in some adjacent basins, accompanied by impacts to springs, stream baseflows, wetlands and groundwater-dependent vegetation where the latter are present. In particular, project pumping under the Proposed Action represents approximately 115 percent of the annual rate of recharge (natural replenishment) to aquifers in Cave, Dry Lake, and Delamar Valleys, at least 98 percent of the annual rate of recharge to aquifers in Spring Valley, and 140 percent of the unallocated groundwater recognized by the draft Utah-Nevada interstate agreement in the Nevada portion of Snake Valley (45 percent or more of the annual rate of groundwater recharge to the valley as a whole), a total of 158 million gallons per day for municipal water supply in perpetuity. Project pumping under Alternative A represents approximately 60 percent of annual recharge to Cave, Dry Lake, and Delamar Valleys, at least 65 percent of annual recharge to Spring Valley, and 100 percent of the unallocated groundwater recognized by the draft Utah-Nevada interstate agreement in the Nevada pmiion of Snake Valley (30 percent or more of annual recharge to the valley as a whole), a total of 102 million gallons per day in perpetuity. In total, pumping under the Proposed Action represents at least 75 percent of annual recharge to the aquifers of the project basins. Pumping under Alternative A, although less, represents at least 50 percent of annual recharge to these semi-arid basins. Because the rate of groundwater pumping (under either scenario) is large compared to the rate of natural replenishment, the project is likely to result in widespread, significant declines in groundwater levels and the capture of springs, streams, and evapotranspiration (natural forms of discharge) within and beyond the project basins over time. Springs, streams, and wetlands are likely to be among the first resources impacted, followed by groundwater-dependent flora and fauna. The DEIS should disclose the magnitude of the proposed pumping in relation to the water budgets of the project basins as a basis for providing a general description of the scope of the impacts which are likely to result from the project, in addition to presenting detailed predictions of drawdown and impacts to individual springs, streams, and other resources which, due to their specificity, are less certain.	Groundwater recharge estimate and estimates of ET and interbasin flow were incorporated into the CCRP model used in the impact assessment as described in Section 3.3.2.8 of the EIS. Model simulated predevelopment water balances and simulated changes in water balance components over time resulting from the pumping activities are provided in Appendix F3.3.16 in the EIS.

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ID	Comment	Response
35028-3	Model Uncertainties and Limitations In an effort to quantify the potential effects of the proposed pumping, a groundwater flow model has been constructed and calibrated and simulations have been performed to estimate drawdown and changes in spring and stream discharge. Many of the uncertainties associated with the model and model predictions are unavoidable given the sparsity of geologic and hydrologic information. However, a great deal of complexity has been built into the model which is unsupported by available hydrologic observations, compounding uncertainties associated with the model and model predictions. Some of these complexities (e.g., complex variations in the assignment of aquifer parameters within major hydrogeologic units) are physically tenable, but greatly exceed the information content of available calibration (hydrologic) data. Other structural complexities appear to be largely based on assumptions about the hydrologic character of geologic structures, notably the incorporation of a large number of regional faults and collections of subsidiary faults as 'horizontal flow barriers' which extend over great distances and to great depths. Still other elements of the model structure (the truncation of the model domain at the Snake Valley boundary) appear to have no physical basis, but significantly affect predictions of drawdown and the capacity of the model to predict the effects of project pumping in areas which may be affected. To a large degree, the model reflects a particular concept of the groundwater flow system and the model predictions are a manifestation of that concept. Collectively, these complexities and assumptions produce uncertainties in the model predictions which have not been adequately evaluated or disclosed in the DEIS, or by reference in the model reports.	See response WR-1 regarding model development and available data; WR-3 regarding the representation of faults in the CCRP model; and WR-6 regarding the northeast boundary of the model.
35028-4	Disclosure of Model Uncertainties Section 3.3.2.8 of the DEIS (Central Carbonate-Rock Province (CCRP) Model Construction, Calibration, Uncertainty, and Limitations) includes a general description of the model construction and calibration process and the challenges of model calibration. This same section provides a limited, largely generic discussion of uncertainties associated with the development of the conceptual and numerical models as a result of data limitations, the need to generalize and simplify, and the numerical discretization. It does not, however, include a description of the potential effects of specific model uncertainties on the model predictions. In view of the importance of the flow model predictions to subsequent impact analyses, Section 3.3.2.8 (and complementary sections of the model reports) should be expanded to include a more complete and specific description of uncertainties associated with the structure, boundary conditions, and calibration of the CCRP model and their potential effects on the model predictions, including uncertainties arising in connection with the following: 1) the sparsity and nformation content of the calibration data; 2) verparameterization (the total number of parameters comprising the model, whether assigned or calibrated); 3) the incorporation of numerous horizontal flow barriers;" 4) the specification of constant head conditions on the lateral model boundaries; 5) the plausibility of model-calibrated transmissivities of up to 970,000 ft2/day; 6) poor reproduction of spring discharges; 7) the capacity of the model to reproduce heads in the carbonate aquifer which match the elevations of carbonate springs; 8) weak calibration of spring "conductances;" and 9) assumed rates of depth decay of hydraulic conductivity within regional modeling units (RMUs).	Please refer to the response to your comment #40.
35028-5	Moreover, drawdown predictions produced using the calibrated model are believed to approximate the minimum areal extent and magnitude of drawdown that will result from project pumping (SNWA, 2010), and yet were used for the impact analyses. Calibrated model conductivities are deemed to be low if anything, while the specific yield assigned to upper valley fill is deemed to represent the highest plausible value(s), i.e., the model represents a minimum diffusivity interpretation of the flow system which yields estimates of the minimum extent of drawdown rather than a best estimate. In an effort to characterize the effects of uncertainties in the calibrated RMU parameters, a bounding simulation has been performed for Alternative A pumping. Whereas the bounding value used for the specific yield of upper valley fill is reasonable (I 0 percent), the bounding values used for RMU conductivities were a mere 1.5-fold increase over the calibrated values- a fraction of an order of magnitude increase in the value of an aquifer parameter that typically varies orders of magnitude in any particular lithology at the simulated scale. Increases in RMU conductivities above the tested values produced large residuals (reduced the model fit compared to the calibrated model). Is this because the calibrated model is a near perfect representation of the flow system? Or is it because the simulation of groundwater flow is so constrained by the incorporation of 50 plus 'horizontal flow barriers' that a more robust range of RMU aquifer parameters cannot be tested? The description of model uncertainties in both the DEIS and simulation model report (SNW A, 20 I 0) should be expanded to explain this result.	See response WR-11

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ID	Comment	Response
35028-6	Disclosure of Model Limitations Section 3.3.2.8 of the DEIS (CCRP Model Construction, Calibration, Uncertainty, and Limitations) includes a general description of the limitations of the model, with a somewhat more detailed discussion provided by reference in the numerical model report (SNW A, 2009). However, the discussion of model limitations should be expanded to disclose that: I) predicted drawdowns presented and utilized in the DEIS represent the response of a system which is dissected by numerous barriers to lateral groundwater flow (as is evident in 1-foot contours of the predicted drawdowns); 2) actual drawdown due to project pumping may differ significantly from the predicted drawdowns to the extent that some, if not many, of the 50 plus faults (and collections of faults) incorporated in the model as 'horizontal flow barriers' are, in fact, not barriers to groundwater flow; 3) the model is a poor predictor of spring and stream discharge, consequently a poor predictor of pumping-induced changes in spring and stream discharge (i.e., due to the sparsity and information content of spring and stream discharge calibration data, considerable uncertainties concerning mechanisms which give rise to individual spring flows, and the weak calibration of spring and stream conductances); 4) the truncation of the model domain at the Snake Valley boundary and specification of constant head conditions on this and other portions of the eastern boundary of the model have compromised predictions of drawdown in Snake Valley and Fish Springs Flat to an unknown degree; 5) due to the truncation of the model domain at the Snake Valley boundary, the model cannot simulate the propagation of project-induced drawdown into basins east of Snake Valley (basins which have been omitted from the model such as Pine, Wah Wah, and Tule Valleys); 6) the truncation of the model domain at the Snake Valley boundary precludes the estimation of cumulative drawdown due to project pumping in Snake Valley and foreseeable future pumping in adjacent Utah basins (e.g., Pine and Wah Wah Valleys); and 7) predictions of drawdown are only indicative of future groundwater level declines to the extent that pumping by other entities does not increase beyond the currently projected levels and no changes in climatic conditions occur over the period of the GWD Project (i.e., in perpetuity).	See response WR-1 regarding the use of the CCRP model for the programmatic impact analysis; response WR-3 regarding the representation of faults in the calibrated CCRP model used in the EIS analysis; response WR-6 regarding the model domain boundary for the CCRP model; response WR-2 regarding the timeframes used to simulate drawdown; and discussions provided in Section 3.3.2.8, and 3.3.3.3 regarding climate change.
35028-7	Notably, the DEIS (Section 3.3.2.8) states that CCRP model predictions "provide valuable insight as to the general, long-term drawdown patterns and relative trends likely to occur from the various pumping scenarios, but do not have the level of accuracy required to predict absolute values at specific points in time, especially decades to centuries into the future." This section of the DEIS additionally refers the reader to the numerical model report (SNW A, 2009) for a more complete description of the uncertainties and limitations of the CCRP model wherein the model is described as "a reasonable tool for estimating probable regional-scale drawdown patterns and trends over time" (page 8-2). If the predictive capacity of the model is indeed limited to regional-scale assessments and providing insight into general, long-term drawdown patterns and relative trends (as stated), it is not suitable for assessing impacts to site-specific water resources such as springs, perennial stream reaches, wetlands, and flowing artesian wells at particular locations, or the biological resources that depend on them. The text of the DEIS and model report should be modified to reflect that the CCRP model (in its present state) lacks the capacity to predict site-specific impacts to water resources (such as those found on Pahranagat National Wildlife Refuge (NWR) and Fish Springs NWR), but has been used nonetheless as a basis for the impact analyses since currently the best tool available. Specifically, the limitations of the model are not limited to predicting impacts at specific points in time (with accuracy), but also include predicting impacts at specific locations (e.g., specific springs, streams, and wetlands). The text should be modified to reflect that model predictions of drawdown and changes in spring/stream discharge at specific locations are highly uncertain due to the limitations of the flow model, and consequently the analysis of impacts to groundwater-dependent aquatic species is highly uncertain.	See response WR-1 regarding the use of the CCRP model for the programmatic impact analysis.

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ID	Comment	Response
35028-8	Full Disclosure of Potential Impacts to Water Resources The potential impacts of the GWD Project have not been fully evaluated or disclosed with respect to the following: I) the impact analyses are based on drawdown predictions produced using the calibrated CCRP model, which yields minimum estimates of the areal extent and magnitude of project-induced drawdown according to the simulation model report (SNW A, 20 I 0); 2) simulated project pumping has been distributed to "minimize pumping effects" in the impact simulations in unspecified ways (Simulation Model Repott, November 2009), consequently represents a best case; 3) although not disclosed in either the DEIS or model reports, the vast majority of project pumping has in fact been simulated in upper valley fill which has storage coefficients that are many orders of magnitude higher than that of the regional carbonate aquifer, minimizing estimates of project-induced groundwater level declines; 4) the preponderance of production targets identified to date by the project proponent through exploratory drilling and testing are comprised of carbonate units and the damage zones of rangebounding faults, yet project pumping has been simulated almost exclusively in higher storativity upper valley fill; 5) the impact analyses are based on the areal extent of model-simulated drawdown in amounts equal to or greater than 10-feet, despite the potential for substantial impacts to springs, streams, wetlands, and water-dependent biological resources as a result of lesser amounts of drawdown; 6) simulated declines in the elevation of the water table (located primarily in valley fill and other surficial units) have been used to estimate potential impacts to carbonate springs, rather than predicted changes in hydraulic head in carbonate units which are deemed to be the source of the springs; 7) project pumping is expected to continue in perpetuity, but the impact analyses are based on simulations of project-induced drawdown at 200 years after full build-out (FBO); 8) the impact analyses are based on simulated drawdown at 200 years after FBO, even though the effects of project pumping are expected to take hundreds to thousands of years to fully develop; and 9) reasonably foreseeable, future groundwater development has been narrowly defined for the purposes of the cumulative impact simulations, as discussed further below.	The potential effects to water resources are addressed in Section 3.3 of the EIS. See response WR-1 regarding the use of the CCRP groundwater flow model in the impact assessment. See comment WR-2 regarding the timeframes use for the programmatic analysis.
35028-9	Sufficiency of the Cumulative Effects Analysis We find the cumulative effects analysis for the DEIS to be too limited, both in timeframe and geographic scope. The DEIS describes the cumulative effects analysis for Tier I project facilities as including "the combined effects of the project facilities, past and present actions, and the reasonably foreseeable projects within the time frame required to complete this EIS process (expected to be 2012)" (emphasis added). As it pertains to groundwater development, the DEIS describes reasonably foreseeable projects as those that were known at the time the modeling effort was initiated in 2006 (Section 2.9, page 2-90). This does not appear to reflect guidance in BLM's National Environmental Policy Act (NEPA) Handbook (H-1790-1), in which section 6.8.3.3 recommends basing the timeframe of the cumulative effects analysis on the duration of the direct and indirect effects of the proposed action and alternatives. Given that construction and operation of the GWD Project and resulting effects (both direct and indirect) on resources will be long-term, it does not seem reasonable to be overly prescriptive and limiting in the cumulative effects analysis. On the other hand, carrying the cumulative effects analysis out far into the future, as would happen if BLM considered the full duration of indirect effects, would require an unreasonable amount of speculation about future activities. Some compromise must be found in order to ensure that BLM decision makers have complete information for evaluating the consequences of approving this project. Additionally, being less restrictive with the criteria for determining Reasonably Foreseeable Future Actions (RFFA) could increase the longevity of the Tier I analysis and the value for subsequent tiering, as described in BLM's NEPA Handbook.	The BLM is continuing to use its criteria of including projects in the RFFA that have sufficient project information (via a ROW application) to be able to estimate surface disturbance and other resource uses. The wholesale withdrawal or dormancy of many renewable energy projects in the cumulative study area reinforces the importance of avoiding speculation about future projects.
35028-10	The BLM outlines its criteria for determining which actions to consider as Reasonably Foreseeable Future Actions (RFFA) in Section 2.9.1.2 (Reasonably Foreseeable Future Actions, page 2-93) of the DEIS. These include evidence of continued development activity within the past year for projects on private land; and for projects with an approved Environmental Assessment (EA) or EIS, there must be evidence of continued development activity within a year of receiving a Record of Decision and Right-of-Way grant. This one-year timeframe seems overly restrictive given the long-term nature of the GWD Project. Some actions not included in the Tier I cumulative effects analysis have shown considerable recent commitment of resources by the project applicant in order to meet environmental compliance requirements, even if there has been no activity within the last year. For example, the Coyote Springs Investment (CSI) development in Coyote Spring Valley (Clark and Lincoln Counties) is not included in the analysis despite considerable past activity and resources devoted to development of a Multi Species Habitat Conservation Plan and completion of other environmental compliance documents. The exclusion of this project from the cumulative effects analysis also seems incongruous given the identification of CSI groundwater rights in Coyote Spring Valley as a reasonably foreseeable, future groundwater use (Table 2.9-4, page 2-101). The decision concerning LS Power's White Pine Power Project is similarly confusing: the groundwater development associated with this project is analyzed as "reasonably foreseeable" (with a note that it is assumed the project will start in 2020), but the project itself is described as "on hold" and not included in the GWD Project Tier I cumulative effects analysis (page 2-99).	1. The Coyote Springs Development has been added to the cumulative analysis since there is some evidence of a commitment of resources to develop the project 2..The LS Power plant water requirements were included in the groundwater analysis prior to the decision to halt the project, and therefore inclusion of this project represents an overestimate of groundwater drawdown effects. BLM has not included the surface disturbance aspects of the project because it doesn't meet the time frame criteria for Tier 1 GWD RFFA facilities. 3. The programmatic treatment of solar facilities in the PEIS is not sufficient to include them in the Tier 1 GWD RFFA list. If specific facilities are proposed in the future, they will be included in subsequent NEPA tiers.

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35028-11	Other NEPA analyses of a regional and programmatic nature appear to utilize broader criteria for determining RFFA, such as the December 2010 Solar Energy Development Draft Programmatic EIS (Solar PEIS) prepared by BLM and the Department of Energy. The Solar PEIS recognized that the cumulative effects analysis could appropriately include activities that would occur during the timeframe used for the general analysis in the PEIS, although it was also recognized that little to no information on projects was available past five to ten years. In cases where project specifics are unknown and analyses are done conceptually, assumptions can be made (and described in the text) regarding the overall potential for future development in the cumulative effects analysis area, as was done in the Solar PEIS. Also, we note that the two documents are inconsistent in the way they classify projects as RFFA. For example, the BrightSource Coyote Springs Solar project is described as a RFFA in the Solar PEIS, but it is not included as a RFF A in the GWD Project DEIS.	The programmatic treatment of solar facilities in the PEIS is not sufficient to include them in the Tier 1 GWD RFFA list. An acknowledgement of the potential future solar developments within project basins has been included in the FEIS, with recognition that the footprint and water needs will require evaluation in future NEPA. If specific facilities are proposed in the future, they will be included in subsequent NEPA tiers.
35028-12	Additionally, the GWD Project DEIS should better explain why there are relatively few reasonably foreseeable, future groundwater uses in the hydrologic Region of Study. Again, it appears that BLM is defining RFFA too narrowly considering the GWD Project timeline and how long it will take pumping impacts to reach full effect. It does not seem reasonable to assume that, over the lifetime of the GWD Project, there will be no additional groundwater extractions from basins within the Region of Study that have unallocated water (e.g., White River Valley, Utah side of Snake Valley). Also, based on the information presented in Table 2.9-5 of the DEIS (Estimated Cumulative Total Groundwater Consumptive Use by Hydrologic Basin), it appears that development of some of the existing permitted groundwater rights were not considered by BLM to be RFF A. In our opinion, it seems reasonable to assume that currently undeveloped but permitted groundwater rights will be put to use in the future and, therefore, the potential consumptive use portion of these groundwater rights should be considered RFFA.	The inclusion of groundwater sources was based on what was considered reasonably foreseeable at the current time. In summary, it is likely that there will be future groundwater development proposals as noted by the commenter; however, there is insufficient information to include them in the Tier 1 GWD analysis.
35028-13	Lastly, the geographic scope of the cumulative effects analysis does not encompass the area in which project effects will occur. Truncation of the model domain at the Snake Valley boundary limits BLM's ability to analyze cumulative effects resulting from future groundwater uses in Snake Valley and adjacent basins on resources of concern in Utah, including at Fish Springs NWR.	A qualitative analysis of effects beyond the model domain has been completed in the water section of the FEIS and was considered for water dependent resources. Please review standard resource response WR-6 for additional information.
35028-14	Potential for Impacts to Groundwater-dependent Ecosystems and Associated Fauna Many endemic and rare species (including federally listed species and others that are candidates for listing under the Endangered Species Act) within the Region of Study inhabit ecosystems that are greatly influenced by or depend wholly on groundwater availability for their persistence. Small changes or fluctuations in groundwater levels (i.e., less than I 0 feet) could affect spring discharge (Mayer and Congdon 2008); the extent of aquatic systems (Patten eta!. 2008); and composition, cover, and structure of wetland, meadow, riparian and phreatophytic shrub land vegetation communities (Stromberg eta!. 1996, Castelli eta!. 2000, Elmore eta!. 2003, Patten et a!. 2008). However, predicting and interpreting ecosystem response is complex (e.g., plant species will respond differently) and can be confounded by numerous factors (Naumburg eta!. 2005). Changes in the magnitude, frequency, timing, and duration of spring or stream annual and low flows could substantially affect water temperature, chemistry, and other physical habitat components. This in turn could affect aquatic communities by: I) altering habitat needed by fauna during particular life stages (e.g., breeding, spawning, foraging, and over-wintering habitat for fish or frogs); 2) modifying overall assemblage structure and complexity; and 3) potentially rendering systems less resilient (Kennen and Riskin 2010).	The impacts of groundwater pumping on aquatic biological resources including sensitive and native species are analyzed in Section 3.7 of the EIS.
35028-15	While BLM acknowledges in the DEIS that groundwater-dependent ecosystems are sensitive to groundwater drawdown of less than ten feet, BLM has chosen to base its impact analysis primarily on the areal extent of model-simulated drawdown in amounts equal to or greater than ten feet. This is based on several lines of reasoning, including the unavoidable uncertainty associated with the CCRP model predictions and the fact that changes in groundwater levels of less than ten feet can be difficult to distinguish from seasonal and annual fluctuations in groundwater levels. However, the full extent of potential impacts from project pumping is not disclosed by utilizing this approach. We agree that the regional model has limited utility for predicting site-specific impacts and that there is a high degree of uncertainty associated with the model predictions in terms of location, timing, and amount of drawdown. Nonetheless, actual impacts could be higher or lower than what is currently predicted at any particular location, including at sites outside the I 0-foot drawdown contour. Additionally, it should be possible to distinguish seasonal and other climatic variations in groundwater levels and spring flows from pumping-induced changes by monitoring spatial and temporal trends (i.e., through a robust monitoring program), though this will depend in part on the amount and rate of pumping-induced change and the amount of natural variation in each system. Because groundwater-dependent ecosystems are sensitive to small changes in groundwater levels, the prediction of which is subject to numerous uncertainties (as outlined above), it would behoove BLM to consider the potential for impacts more broadly by considering the potential for impacts beyond the model predicted 10-ft drawdown contour. For example, the fact that the CCRP model predicts substantial flow reductions at Flag Springs, which falls outside the I 0-foot draw down contour, by 200 years after FBO supports utilizing something other than the I 0-ft drawdown contour for delineating the area of potential impact.	Please see standard resource responses MM-1, MM-2 and WR-1 for information concerning this comment.

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35028-16	In view of the above, we find that the DEIS conveys an unwarranted level of certainty concerning the potential for effects to aquatic fauna that occur outside the ten-foot drawdown contour. For example, based on CCRP model predictions, BLM concludes that pumping under all alternatives would "not affect" federally-listed fish in Pahranagat Valley (Hiko White River springfish, White River springfish, and Pahranagat roundtail chub) and the Muddy River Springs Area (Moapa dace; page 3.7-44), and would pose only "slight risk" to aquatic habitats in Pine Valley, Tule Valley, Wah Wah Valley, and Fish Springs Flat (page 3.7-46). Similarly, BLM concludes in Section 3.14.2 of the DEIS (Special Designations and Lands with Wilderness Characteristics, Environmental Consequences) that pumping under all alternatives would not compromise Pahranagat NWR (Fish Springs NWR is notably absent from the discussion of environmental consequences to special designations; we request that this be remedied).	Based on the model analysis used in this EIS, there is a low risk of groundwater pumping effects on federally-listed species in Pahranagat Valley. Potential flow reductions in Ash, Crystal, and Hiko springs were estimated to be 0 to 2 percent for pumping by the various project alternatives. Regarding the conclusion in Section 3.14.2.8, data from the groundwater model indicates no impacts to wetland meadow and phreatophytic vegetation would be anticipated until 200 years after full build out, which is estimated to be 225 acres and would not compromise the objectives of the 17,992-acre refuge. The analysis in Section 3.14 only discloses impacts to areas affected. Since Fish Springs NWR is neither crossed by a ROW or groundwater development area and no impacts to wetland meadow and phreatophytic vegetation are anticipated from the groundwater model data, there are no impacts to Fish Springs NWR included in Section 3.14. Section 3.3 provides a more thorough analysis of groundwater drawdown in the region.
35028-17	We request that BLM present its effects conclusions within the context of model uncertainties and limitations.	Uncertainty and limitations associated with the CCRP groundwater model developed for the project are discussed in Section 3.3.2.8 of the EIS and in the model documentation incorporated by referenced in this section. Other statements of uncertainty are provided as appropriate in the discussion of potential impacts to water resources provided in Section 3.3.
35028-18	We note that the DEIS presents a limited discussion in this regard in support of the "slight risk" predictions to aquatic resources in Utah basins adjacent to Snake Valley, but fails to explain that the "no effect" conclusion to Pahranagat Valley aquatic resources is also subject to considerable uncertainty. Additionally, we noticed that there is no mention in Section 3.7.2.9 (Aquatic Biological Resources- Environmental Consequences: Other Special Status Fish Species, Invertebrates, and Utah Pumping Effects) of the potential for adverse impacts to two Utah aquatic species of concern that occur in northern Snake Valley: the sub-globose snake pyrg (a species that has been petitioned for listing under the Endangered Species Act) and least chub (a candidate for listing) (see page 3.7-44 through 3.7-46 and other relevant pages for other alternatives). The CCRP model predicts a small amount of flow reduction at Foote Reservoir Spring, which is in the general area occupied by least chub and sub-globose snake pyrg.	Text was added to the invertebrate section for sub-globose Snake pyrg regarding minor flow reductions of 0 to 2 percent in Foote Reservoir. The predicted flow reduction for Foote Reservoir was estimated to be 0 to 2 percent for pumping by the various action alternatives. This relatively low flow change is considered to be within the range of error for measuring flows in waterbodies.
35028-19	Ecological Uncertainties In addition to the uncertainties associated with the CCRP model and the other hydrologic analyses, ecological responses to groundwater drawdown and diminished flow are equally uncertain. For example, we do not know how endemic fish and aquatic invertebrates in these particular spring systems will respond to incremental decreases in flow (and the rate of this response), and if there will be ecological thresholds where a small change in flow leads to a large system response (which could result in loss of viable fish populations). Empirically based flow ecology response models are needed to provide insight into those aspects of flow needed to maintain the integrity of groundwater-dependent ecosystems and viable populations of aquatic fauna within the Region of Study (Kennen and Riskin 2010). We request that BLM require the collection of empirical data which will support the development of quantitative relationships between flow variables and ecological response variables, and that this be done prior to future tiered NEPA so as to better inform these analyses. In other words, we request that BLM include monitoring recommendation GW-MN-AB-3 as a condition of the Right-of-Way permit. Such studies, including selection of the Principal Investigators, should be administered by an oversight group such as the Biological Work Group and Executive Committee established by the Department of Interior-SNW Stipulations.	Please review standard resource responses MM-1, MM-2 and MM-3 for information relevant to this comment. Section 3.20 describes a process for identifying and collecting data necessary to complete subsequent NEPA.
35028-20	Potential for Impairment of Public Trust Resources We continue to be concerned about the large predicted impacts to biological resources in Spring Valley as a consequence of the proposed groundwater development. Because project pumping represents a substantial proportion of annual recharge to aquifers in Spring Valley under all alternatives, we anticipate extensive and sizeable impacts to groundwater-dependent ecosystems and associated fauna in this valley, including northern leopard frog, springsnails, greater sage grouse, relict dace, and potentially Pahrump poolfish, depending on the effectiveness of proposed mitigation measures (see discussion below).	The purpose of the NEPA (EIS) process is to disclose potential project impacts. The BLM appreciates that you have identified your specific concerns regarding the impacts disclosed in the DEIS.
35028-21	We are also greatly concerned about the potential for substantial and potentially irretrievable impacts to Big Springs and nearby smaller springs in southern Snake Valley as a consequence of proposed groundwater pumping. The Big Springs Creek/Lake Creek system is unique in that it harbors an assemblage of five native Bonneville Basin fish and two springsnail species, both of which have been petitioned for listing under the Endangered Species Act. One of these two springsnail species, the longitudinal gland pyrg, is only known from the Big Springs system (including Stateline Springs) and two smaller springs that are relatively close by. Cessation of flow in these springs would result in complete loss of all known longitudinal gland pyrg populations, and it is possible that significant or complete losses would occur with decreased flow (i.e., something short of flow termination), especially if sustained over the long-term.	Please see Standard Resource Responses MM-1, MM-2 and MM-3 for information concerning this comment.

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ID	Comment	Response
35028-22	Current CCRP model predictions show Big Springs ceasing to flow by 30 years after full buildout under both the Proposed Action and Alternative A scenarios, and within 75 years after full build-out under most of the other alternatives (note: we assume that under these scenarios, nearby smaller springs will go dry even sooner). Even if pumping does not occur in Snake Valley (e.g., Alternative E), the CCRP model still indicates potential for substantial impacts to the Big Springs Creek system and nearby springs due to Spring Valley pumping (78% reduction in flow at Big Springs by 200 years after full build-out). Potential impacts could be even greater when past, present, and RFFA are considered, as demonstrated in the cumulative effects analysis.	The results of the model simulation indicates a potential risk of flow reductions in Big Springs; however, there is uncertainty regarding the timing and magnitude of flow reduction as described in Section 3.3.2.8 of the EIS. Please also see standard resource responses MM-1 and MM-2 for further information.
35028-23	Reductions of this magnitude will likely imperil the longitudinal gland pyrg, which is a consequence of project implementation that we find unacceptable. Therefore, we request that BLM require specific protection measures for those springs that harbor longitudinal gland pyrg in order to ensure persistence of this species, with implementation of these measures linked to specific monitoring thresholds. These measures should apply to all of the alternatives considered in the DEIS and should be included as a condition of the Right-of-Way permit. We would like to work with BLM and SNW A to establish the protection measures as part of the informal section 7 consultation process.	Protection of spring habitat for this springsnail species will be included in the comprehensive project-wide monitoring and mitigation plan (COM Plan) for this project. Please also see standard resource responses MM-1, MM-2 and MM-3 for further information.
35028-24	We are also concerned about potential impacts to aquatic systems in northern Snake Valley, Tule Valley, and at Fish Springs NWR. These areas contain populations of the least chub, Columbia spotted frog, northern leopard frog, and the sub-globose snake pyrg. Additionally, we are concerned about potential impacts to aquatic systems in Pahranagat Valley, including valley floor springs and wetland and riparian areas on Pahranagat NWR. Impacts to these areas are predicted to be minimal at most at 200 years after FBO. However, we believe that impacts to northern Snake Valley, adjacent valleys in Utah (including Fish Springs Flat), and Pahranagat Valley may exceed current predictions in view of uncertainties concerning the underlying flow model and units of completion of the simulated production wells versus actual future wells.	A statement regarding risks and uncertainty for aquatic resources in Pine, Wah Wah, Tule, and Fish Springs is provided in the Utah Pumping Effects section for each action alternative. Additional information is provided in Water Resources. Impact analyses for Pahranagat Valley indicated minimal risk to water and biological resources due to groundwater pumping from the action alternatives.
35028-25	Additionally, the impact analyses have so far been limited to a time corresponding to FBO plus 200 years, which falls short of the time required for the full effects of project pumping to develop (i.e., the time required for the groundwater system to reach a new state of equilibrium). Consequently, we believe that maximum drawdown associated with project pumping, both in terms of magnitude and areal extent, could exceed current predictions for FBO plus 200 years. Therefore, the DEIS should present a thorough discussion of groundwater-dependent resources in these areas, the potential for effects to these resources, and how effects will be avoided.	See response WR-2 regarding the future time frames considered for the programmatic analysis of potential effects to water dependant resources.
35028-26	Effectiveness of Proposed Plans for Monitoring, Management, and Mitigation The following comments pertain to the various monitoring, management and mitigation (3M) plans that are included as either applicant committed measures or proposed BLM mitigation measures in the DEIS.	Comment noted.
35028-27	Monitoring, Management, and Mitigation Plans under Stipulated Agreements To date, implementation of the Spring Valley Stipulation and the Delamar, Dry Lake, and Cave Valley Stipulation (Stipulations) has primarily involved development of monitoring plans, which while needed, are not in and of themselves protective of federal trust resources. Additionally, while the Stipulations establish a framework and process for working together to achieve common goals, they do not provide specific assurances regarding unacceptable level(s) of impact and management responses, including mitigation. Therefore, BLM should not rely on them unduly at the Tier 1 NEPA stage as a means of mitigating adverse impacts. "Unreasonable Adverse Effect," which is to be avoided per the Stipulations, has yet to be defined and how specifically this goal will be achieved has not been specified to date. For example, when or if any specific mitigation action would be implemented, and the "triggers" that would lead to implementation of these actions, is uncertain and/or not specified. Additionally, the potential effectiveness of proposed mitigation actions (e.g., redistribution of pumping, curtailment or cessation of pumping, etc.) to avoid or reduce impacts to listed and technical assistance species should be thoroughly examined in order to minimize the possibility of mitigation failure. The results of this analysis should be disclosed (along with any anticipated residual impacts) in the DEIS. Lastly, the management and mitigation portions of the Stipulation 3M plans need to be sufficiently developed (i.e., detailed) by the time future tiered NEP A analyses are done for this project, in order to more accurately assess their effectiveness at avoiding, minimizing, and mitigating project impacts. This will help BLM to determine what additional mitigation measures, if any, are needed and should therefore be included as terms and conditions in future Records of Decision for this project.	Please see Standard Resource Responses MM-1, MM-2 and MM-3 for information concerning this comment. Text has been updated in Chapter 3.20.

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ID	Comment	Response
35028-28	Snake Valley Monitoring, Management, and Mitigation Plan The development of a 3M Plan for Snake Valley (similar to that developed for Spring Valley) has been proposed as a means of mitigating the impacts of project pumping in Snake Valley, and draft guidance for developing this plan is provided in Appendix B of the DEIS. We recommend and support inclusion of this measure as a term and condition for BLM's issuance of the Right of Way permit. We also appreciate BLM including other Department of Interior agencies and the States of Nevada and Utah in the management (oversight) committee and the technical working group responsible for developing the Snake Valley 3M Plan. It is crucial that the Snake Valley 3M Plan is developed and finalized through a multi-party process that includes the relevant resource agencies with state and federal trust responsibilities. While BLM would have authority over the Snake Valley 3M Plan, we envision that BLM will foster an atmosphere of consensus building amongst the various parties, as has been done for the Spring Valley and DOC Stipulations. Success of the Snake Valley 3M Plan (and the overall adaptive monitoring and management approach) will require participation from these multiple stakeholders, as well as a commitment of funding over the long-term, and we are committed to participating in this process.	Thank you for your commitment to building and implementing a 3M Plan for Snake Valley. As indicated in the draft plan, BLM has committed to involvement of other DOI agencies in the formulation and implementation of the plan. The plan also contains a long-term financial commitment on the part of SNWA for monitoring, management, and mitigation efforts. BLM acknowledges the cooperative and collaborative approach that has been instrumental in the success of the stipulated 3M Plan in Spring Valley and DDC valleys. Please see Standard Resource Response MM-1.
35028-29	Given the amount of time between finalization of the Tier 1 EIS and SNWA's proposed development of groundwater in Snake Valley, it seems reasonable to develop the Snake Valley 3M Plan in stages as described in Appendix B. However, we request that a comprehensive 3M Plan be developed and approved by the oversight management group prior to initiation of tiered NEPA analyses in Snake Valley and well in advance of pumping so as to allow for sufficient collection of baseline data. We also recommend that prior to publication of the Final EIS and ROD for this first tier of the project, BLM work with all parties (including Department of Interior agencies, Nevada Department of Wildlife, and Utah Division of Wildlife Resources) to develop an outline of required components of a Snake Valley 3M Plan that is inclusive of all party needs. The agencies need an opportunity outside of the NEPA process to interact with BLM and SNWA about the content of the draft 3M Plan.	See Standard Resource Response MM-1.
35028-30	The initial Snake Valley 3M Plan, which is to be developed by the technical working group within one year of the Tier I EIS Record of Decision, should also include the following elements: • Identification of specific and quantifiable goals and objectives for management of biological resources of concern; • Identification of the minimum number of years of baseline monitoring that will be conducted; • Identification of existing biological monitoring sites to include in the Snake Valley 3M Plan and additional sites to be monitored under the plan; • Identification of the "initial" biological and hydrologic monitoring area (which can change over time, if necessary, based on observed or model-predicted impacts); • Identification of studies that will be implemented (and timeline for implementation) to investigate spring flow-ecological response relationships; • Commitment by SNWA to maintain UGS or USGS hydrologic monitoring at specific sites, if such monitoring were to lapse in the future; and • Commitment by SNWA to update the CCRP groundwater flow model to include basins adjacent to Snake Valley that contribute flow to regional springs in Fish Springs Flat, or to use another regional model(s) approved by the technical working group that includes these basins.	Thank you for your comment. Please see Standard Resource Response MM-1. The BLM will consider these suggested elements and determine if and when they should be defined in the COM Plan.
35028-31	That being said, we still have serious concerns regarding the Snake Valley segment of this proposed project, and the ability of a 3M Plan to satisfy all of those concerns. For example, it should be noted in the DEIS that monitoring cannot provide "early warning" of the propagation of impacts in cases where resources of concern are located close to production wells, as is the case with Big Springs Creek/Lake Creek and nearby springs occupied by longitudinal gland pyrg. Even where early warning is possible, meaningful mitigation options must be available. The rate of pumping proposed in Snake Valley for all alternatives except D and E represent a significant proportion of the basin water budget (e.g., a large fraction of annual groundwater recharge). Under such circumstances, the development of unacceptable levels of drawdown cannot be effectively mitigated by rotating pumping from one well to another. Significant reductions in pumping, or the cessation of pumping, are the only effective mitigations under such conditions. BLM's own model predictions indicate that a substantial period of time (decades to I 00 years or more) would be required for the groundwater system of southern Snake Valley to recover substantially following years of project pumping in Snake Valley at rates proposed under Alternative A, reducing the efficacy of the proposed mitigation measures- up to and including the cessation of project pumping.	Pleaqse refer to section 3.20 and standard resource responses MM-1, MM-2 and MM-3 for information regarding this comment.
35028-32	Therefore, as mentioned previously, specific and binding measures are needed up-front (i.e., before issuance of the ROW permit for Spring and Snake Valley laterals) to ensure persistence of the longitudinal gland pyrg, which is only known from southern Snake Valley and is likely to be severely impacted by project pumping.	A comprehensive description of all mitigation, management and monitoring actions have been compiled in section 3.20. Subsequent to the DEIS, the Fish and Wildlife Service provided technical assistance recommendations for the longitudinal gland purg which have been incorporated into the FEIS. The BLM will describe the mitigation measures related to pumping in the Record of Decision.

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ID	Comment	Response
35028-33	Adaptive Management Plan An Adaptive Management (AM) approach is necessary for a large project such as this that is fraught with uncertainties regarding location, timing, and amount of impacts and the effectiveness of mitigation actions. However, the AM plan outlined in the DEIS, as well as the Spring Valley and DDC Stipulation monitoring plans, are not specific enough at this point in time and cannot provide assurances that adverse effects to species of concern will be avoided or successfully mitigated. An effective AM Plan must do more than outline a process for working toward common goals. A key first step in the AM process is the identification of goals and objectives for the management of biological resources, and these need to be quantifiable and measurable instead of vague concepts (Ruhland Fischman 2010). Criteria for measuring success and the triggers for initiating mitigation actions, including reinitiation of section 7 consultation, should be clearly articulated. While we recognize that defining these criteria and triggers is a very difficult task and will take time (and more data), and that the Biological Work Group for the Spring Valley Stipulation has initiated work on this front, we believe that BLM should require assurances up-front (at the Tier 1 stage) that the Proposed Action will not put at risk the continued existence of species. This is of high importance when it comes to managing SNW A's groundwater withdrawal to ensure the long-term viability of the longitudinal gland pyrg in Snake Valley and the White River spinedace, Flag pyrg, and Butterfield pyrg in White River Valley-species that have potential, based on our current understanding of project impacts, to be substantially impacted by this project throughout most, if not all, of their global range. Since many of the resources of management concern that are subject of the AM plan are Service trust responsibilities, the Service should be actively involved in this AM plan; therefore, we request a role in the annual review process for assessing project impacts, as reference in the AM plan.	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2.
35028-34	BLM Selection of a Preferred Alternative While BLM has not identified a preferred alternative in the DEIS, it does identify Alternative A as a reasonable groundwater development scenario to help focus the public's review of the various alternatives. Additionally, BLM has requested public input regarding the Snake Valley portion of the proposed project due to the high level of controversy and concern expressed by numerous cooperating agencies, including the Service. As explained above, we are concerned about potential impacts to aquatic species in Snake Valley and adjacent basins in Utah as a consequence of additional groundwater development in Snake Valley. Since any production wells installed for the GWD Project in Snake Valley would be constrained to the Nevada side of the basin and to the southern part of the valley, we conclude that impacts to southern Snake Valley aquatic systems (e.g., Big Springs) are unavoidable under any alternative that includes Snake Valley pumping. Because of these concerns, we request that BLM select Alternative E, which does not include the Snake Valley lateral pipeline, as its preferred alternative. Based on BLM's model predictions, Alternative E will result in less extensive and/or less severe impacts to groundwater-dependent ecosystems and associated fauna in Snake Valley and adjacent basins of the Great Salt Lake Desert Groundwater Flow System than Alternative A and the other alternatives. Unlike the main pipeline, the Snake Valley lateral is not authorized under the Lincoln County Conservation Recreation and Development Act (LCCRDA), nor has a final interstate agreement on the management of groundwater resources in Snake Valley been reached, as required by LCCRDA. Additionally, water rights hearings on SNWA's Snake Valley applications have not been set, nor will they likely occur any time soon. These factors, considered together, give credence to Alternative E as a potential preferred alternative.	Thank you for your comment. The BLM has considered your input in its decision on the agency preferred alternative presented in this FEIS.
35028-35	We also recommend that BLM consider selecting one or more of the pipeline alignment options (Alignment Options 1-4). Most of these alignment options appear to reduce impacts to biotic resources by locating stretches of the power line or pipeline in or near areas that have been previously disturbed, or by tying into other proposed transmission projects. It appears that Alignment Option I (Humboldt-Toiyabe Power Line Alignment) and Alignment Option 3 (Muleshoe Substation and Power Line Alignment) would have reduced construction acreage impacts to numerous special status species, and Alignment Option 3 would result in fewer impacts to perennial water sources. Alignment Option 4 (North Delamar Valley Pipeline Alignment) also appears to reduce construction impacts to numerous special status species, but would result in slight increases in habitat impacts to others (e.g., pygmy rabbit). Alignment Option 2 (North Lake Valley Pipeline and Power Line Alignment) would create additional impacts to northern leopard frog, Lake Valley pyrg, and greater sage-grouse by potentially affecting an additional lek and more brood rearing habitat, rendering it (at least upon initial review) to be less preferable to other alignment alternatives.	Thank you for your comment. The BLM has considered your input in its decision on the agency preferred alternative (including the review of alignment options) presented in this FEIS.
35028-36	Additional Considerations Given the high level of concern regarding the potential for impacts to aquatic resources in Utah, including at Fish Springs National Wildlife Refuge, we request that BLM include in the groundwater flow model those Hydrographic Basins to the east of Snake Valley that may be hydraulically connected and contribute subsurface flow to the Fish Springs Flat area (e.g., Pine Valley, Wah Wah Valley, Tule Valley, etc.). We also request that BLM include the entirety of the Fish Springs Flat area within the model domain so as to capture not only the major spring discharge areas on the refuge in a physically meaningful way, but also the wetlands that are dependent on this discharge. If these additional basins are not included in the model for the Tier 1 EIS analysis, then at a minimum, BLM should require SNW A to expand the model domain in this area prior to tiered analyses for Spring Valley and Snake Valley groundwater withdrawal.	See response WR-6 regarding the model boundary and evaluation of impacts to basins located east of Snake Valley; and WR-5 regarding the evaluation of potential impacts to spring discharge at Fish Springs.

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ID	Comment	Response
35028-37	We also request that BLM not issue a Notice to Proceed for any particular segment of the pipeline, such as the laterals into Cave Valley, Spring Valley, or Snake Valley, until such time as SNWA secures the groundwater rights in these valleys and any pending litigation regarding these rights is resolved. In particular, we wish to avoid a situation where the pipeline is constructed in a valley prior to SNWA securing water rights in that valley.	Please see Standard Resource Responses Gen-1 and Gen-2 for information concerning this comment.
35028-38	Magnitude of the Proposed Groundwater Development. The magnitude of the proposed groundwater development is large compared to the rate of recharge in the project basins (rate of natural replenishment). Consequently, the project is likely to result in widespread and substantial declines in groundwater levels within the project basins and significant declines in groundwater levels in some adjacent basins, accompanied by impacts to springs, stream baseflows, wetlands and groundwater-dependent vegetation where the latter are present. In particular, project pumping under the Proposed Action represents approximately 115 percent of the annual rate of recharge (natural replenishment) to aquifers in Cave, Dry Lake, and Delamar Valleys, at least 98 percent of the annual rate of recharge to aquifers in Spring Valley, and 140 percent of the unallocated groundwater recognized by the draft Utah-Nevada interstate agreement in the Nevada portion of Snake Valley (45 percent or more of the annual rate of groundwater recharge to the valley as a whole), a total of 158 million gallons per day for municipal water supply in perpetuity. Project pumping under Alternative A represents approximately 60 percent of annual recharge to Cave, Dry Lake, and Delamar Valleys, at least 65 percent of annual recharge to Spring Valley, and 100 percent of the unallocated groundwater recognized by the draft Utah-Nevada interstate agreement in the Nevada portion of Snake Valley (30 percent or more of annual recharge to the valley as a whole), a total of 102 million gallons per day in perpetuity. In total, pumping under the Proposed Action represents at least 75 percent of annual recharge to the aquifers of the project basins. Pumping under Alternative A, although less, represents at least 50 percent of annual recharge to these semi-arid basins. Because the rate of groundwater pumping (under either scenario) is large compared to the rate of natural replenishment, the project is likely to result in widespread, significant declines in groundwater levels and the capture of springs, streams, and evapotranspiration (natural forms of discharge) within and beyond the project basins over time. Since springs, streams, and wetlands occupy the top of the hydrologic system, they are likely to be among the first resources impacted, followed by groundwater-dependent biological resources and vegetation. The EIS (ES 2.13 and the introductory text of Sections 3.3.2.9 to 3.3.2.14) should disclose the magnitude of the proposed pumping in relation to the water budgets of the project basins as a basis for providing a general description of the scope of the impacts which are likely to result from the project, in addition to presenting detailed predictions of drawdown and impacts to individual springs, streams, and other resources which, due to their specificity, are less certain.	The EIS used the results of the groundwater flow model combined with available information on water resources in the region to identify the potential risk to water resources within the region of study. Information regarding recharge to the groundwater system was provided in the conceptual model and numerical model reports prepared for the project (SNWA 2009a and 2009b) that were incorporated by reference and included on the CD provided with the DEIS.
35028-39	Uncertainties and Limitations Associated with the CCRP flow model and predictions. In an effort to quantify the potential effects of the proposed pumping, a groundwater flow model has been constructed and calibrated and simulations have been performed to estimate drawdown and changes in spring and stream discharge. Many of the uncertainties associated with the model and model predictions are unavoidable given the sparsity of geologic and hydrologic information. However, a great deal of complexity has been built into the model which is unsupported by available hydrologic observations, compounding uncertainties associated with the model and model predictions. Some of these complexities (e.g., complex variations in the assignment of aquifer parameters within major hydrogeologic units) are physically tenable, but greatly exceed the information content of available calibration (hydrologic) data. Other structural complexities appear to be largely based on assumptions about the hydrologic character of geologic structures, notably the incorporation of a large number of regional faults and collections of subsidiary faults as 'horizontal flow barriers' which extend over great distances and to great depths. Still other elements of the model structure (the truncation of the model domain at the Snake Valley boundary) appear to have no physical basis, but significantly affect predictions of drawdown and the capacity of the model to predict the effects of project pumping in areas which may be affected. To a large degree, the model reflects a particular concept of the groundwater flow system and the model predictions are a manifestation of that concept. Collectively, these complexities and assumptions produce uncertainties in the model predictions which have not been adequately evaluated or disclosed in the DEIS (Section 3.3.2.8), or by reference in the model reports (SNWA 2009b, the Simulation Model Report dated November 2009, and SNWA 2010a & 2010b).	The uncertainties and limitation of the regional groundwater flow model used in the EIS analysis of effects to water resources is summarized in Section 3.3.2.8 and additional detail is provided in the model related documents that were incorporated by reference within this section and included on the CD provided with the DEIS.

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ID	Comment	Response
35028-40	Disclosure of Model Uncertainties. Section 3.3.2.8 of the DEIS (CCRP Model Construction, Calibration, Uncertainty, and Limitations) includes a general description of the model construction and calibration process and the challenges of model calibration. This same section provides a limited, largely generic discussion of uncertainties associated with the development of the conceptual and numerical models as a result of data limitations, the need to generalize and simplify, and the numerical discretization, but includes no description of the potential effects of specific model uncertainties on the model predictions. In view of the importance of the flow model predictions to subsequent impact analyses, Section 3.3.2.8 (and complementary sections of the model reports) should be expanded to include a more complete and specific description of uncertainties associated with the structure, boundary conditions, and calibration of the CCRP model and their potential effects on the model predictions, including uncertainties arising in connection with the following: 1) the sparsity and information content of the calibration data; 2) overparameterization (the total number of parameters comprising the model, whether assigned or calibrated); 3) the incorporation of numerous 'horizontal flow barriers'; 4) the specification of constant head conditions on the lateral model boundaries; 5) the plausibility of model-calibrated transmissivities of up to 970,000 ft2/day; 6) poor reproduction of spring discharges; 7) the capacity of the model to reproduce heads in the carbonate aquifer which match the elevations of carbonate springs; 8) weak calibration of spring 'conductances'; and 9) assumed rates of depth decay of hydraulic conductivity within regional modeling units (RMUs). Moreover, drawdown predictions produced using the calibrated model are believed to approximate the minimum areal extent and magnitude of drawdown that will result from project pumping (SNWA, 2010b), and yet were used for the impact analyses. Calibrated model conductivities are deemed to be low if anything, while the specific yield assigned to upper valley fill is deemed to represent the highest plausible value(s), i.e., the model represents a minimum diffusivity interpretation of the flow system which yields estimates of the minimum extent of drawdown rather than a best estimate. In an effort to characterize the effects of uncertainties in the calibrated RMU parameters, a bounding simulation has been performed for Alternative A pumping. Whereas the bounding value used for the specific yield of upper valley fill is reasonable (10 percent), the bounding values used for RMU conductivities were a mere 1.5-fold increase over the calibrated values – a fraction of an order of magnitude increase in the value of an aquifer parameter that typically varies orders of magnitude in any particular lithology at the simulated scale. Increases in RMU conductivities above the tested values produced large residuals (reduced the model fit compared to the calibrated model). Is this because the calibrated model is a near perfect representation of the flow system? Or is it because the simulation of groundwater flow is so constrained by the incorporation of 50 plus 'horizontal flow barriers' that a more robust range of RMU aquifer parameters cannot be tested? The description of model uncertainties in both the DEIS and simulation model report (SNWA, 2010b) should be expanded to explain this result.	The model's uncertainties and limitations are extensively addressed in the DEIS Section 3.3.2.8 and in the numerical model report in section 7.0 (SNWA, 2009b). Provision of the potential effects of specific model uncertainties on the model predictions is not common modeling practice. Regarding specifically listed items: 1) sparsity of data [see response WR-15] 2) over parameterization [see response WR-16] 3) horizontal flow barriers [see response WR-3] 4) constant heads on the lateral model boundaries [Flows at the boundaries are small relative to overall budget and heads at the boundaries are more easily measured and thus better known than most model parameters. Also estimated flows at the boundaries allowed for calibration of the head values] 5) plausibility of model-calibrated transmissivities [the approximately 1 million ft2/day transmissivity is consistent with aquifer test results in the Arrow Canyon area 6) spring discharges are well matched, see Figures 6-17 through 6-31 and 6-33 and 6-34 of the numerical model report (SNWA 2009b) 7) simulated spring flows match observed flows indicating the simulated heads in carbonates that support carbonate springs are reasonable see Figure 6-33of the numerical model report (SNWA 2009b) 8) spring calibration see Figures 6-17 through 6-34of the numerical model report (SNWA 2009b) 9) depth decay [see response WR-12]

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ID	Comment	Response
35028-41	Disclosure of Model Limitations. Section 3.3.2.8 of the DEIS (CCRP Model Construction, Calibration, Uncertainty, and Limitations) includes a general description of the limitations of the model, with a somewhat more detailed discussion provided by reference in the numerical model report (SNWA, 2009b). However, the discussion of model limitations should be expanded to disclose that: 1) predicted drawdowns presented and utilized in the DEIS represent the response of a system which is dissected by numerous barriers to lateral groundwater flow (as is evident in 1-foot contours of the predicted drawdowns); 2) actual drawdown due to project pumping may differ significantly from the predicted drawdowns to the extent that some, if not many, of the 50 plus faults (and collections of faults) incorporated in the model as 'horizontal flow barriers' are, in fact, not barriers to groundwater flow; 3) the model is a poor predictor of spring and stream discharge, consequently a poor predictor of pumping-induced changes in spring and stream discharge (i.e., due to the sparsity and information content of spring and stream discharge calibration data, considerable uncertainties concerning mechanisms which give rise to individual spring flows, and the weak calibration of spring and stream conductances); 4) the truncation of the model domain at the Snake Valley boundary and specification of constant head conditions on this and other portions of the eastern boundary of the model have compromised predictions of drawdown in Snake Valley to an unknown degree; 5) due to the truncation of the model domain at the Snake Valley boundary, the model cannot simulate the propagation of project-induced drawdown into basins east of Snake Valley (basins which have been omitted from the model such as Pine, Wah Wah, and Tule Valleys); 6) the truncation of the model domain at the Snake Valley boundary precludes the estimation of cumulative drawdown due to project pumping in Snake Valley and foreseeable future pumping in adjacent Utah basins (e.g., Pine and Wah Wah Valleys); and 7) predictions of drawdown are only indicative of future groundwater level declines to the extent that pumping by other entities does not increase beyond the currently projected levels and no changes in climatic conditions occur over the period of the project (i.e., in perpetuity). Notably, the DEIS (Section 3.3.2.8) states that CCRP model predictions 'provide valuable insight as to the general, long-term drawdown patterns and relative trends likely to occur from the various pumping scenarios, but do not have the level of accuracy required to predict absolute values at specific points in time, especially decades to centuries into the future'. This section of the DEIS additionally refers the reader to the numerical model report (SNWA, 2009b) for a more complete description of the uncertainties and limitations of the CCRP model wherein the model is described as 'a reasonable tool for estimating probable regional-scale drawdown patterns and trends over time' (page 8-2). If the predictive capacity of the model is indeed limited to regional-scale assessments and providing insight into general, long-term drawdown patterns and relative trends (as stated), it is not suitable for assessing impacts to site-specific water resources such as springs, perennial stream reaches, wetlands, and flowing artesian wells at particular locations, or the biological resources that depend on them. The text of the DEIS and model report should be modified to reflect that the CCRP model (in its present state) lacks the capacity to predict site specific impacts to water resources, but has been used nonetheless as a basis for the impact analyses since currently the best tool available. Specifically, the limitations of the model are not limited to predicting impacts at specific points in time (with accuracy), but also include predicting impacts at specific locations (e.g., specific springs, streams, and wetlands). The text should be modified to reflect that model predictions of drawdown and changes in spring / stream discharge at specific locations are highly uncertain due to the limitations of the flow model, and consequently the analysis of impacts to groundwater-dependent aquatic species is highly uncertain.	See response WR-1 regarding the use of the CCRP model for the programmatic impact analysis; response WR-3 regarding the representation of faults in the calibrated CCRP model used in the EIS analysis; response WR-6 regarding the model domain boundary for the CCRP model; response WR-2 regarding the timeframes used to simulate drawdown; and discussions provided in Section 3.3.2.8, and 3.3.3.3 regarding climate change.

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ID	Comment	Response
35028-42	Full Disclosure of Potential Impacts to Water Resources. The potential impacts of project pumping have not been fully evaluated or disclosed with respect to the following: 1) the impact analyses are based on drawdown predictions produced using the calibrated CCRP model, which yields minimum estimates of the areal extent and magnitude of project-induced drawdown according to the simulation model report (SNWA, 2010b); 2) simulated project pumping has been distributed to "minimize pumping effects" in the impact simulations in unspecified ways (Simulation Model Report, November 2009), consequently represents a best case; 3) although not disclosed in either the DEIS or model reports, the vast majority of project pumping has in fact been simulated in upper valley fill which has storage coefficients that are many orders of magnitude higher than that of the regional carbonate aquifer, minimizing estimates of project-induced groundwater level declines; 4) the preponderance of production targets identified to date by the project proponent through exploratory drilling and testing are comprised of carbonate units and the damage zones of range-bounding faults, yet project pumping has been simulated almost exclusively in higher storativity upper valley fill; 5) the impact analyses are based on the areal extent of model-simulated drawdown in amounts equal to or greater than 10-feet, despite the potential for substantial impacts to springs, streams, wetlands, and water-dependent biological resources as a result of lesser amounts of drawdown; 6) simulated declines in the elevation of the water table (located primarily in valley fill and other surficial units) have been used to estimate potential impacts to carbonate springs, rather than predicted changes in hydraulic head in carbonate units which are deemed to be the source of the springs; 7) project pumping is expected to continue in perpetuity, but the impact analyses are based on simulations of project-induced drawdown at 200 years after full build-out (FBO); 8) the impact analyses are based on simulated drawdown at 200 years after FBO, even though the effects of project pumping are expected to take hundreds to thousands of years to fully develop; and 9) reasonably, foreseeable future groundwater development has been narrowly defined for the purposes of the cumulative impact simulations.`	The DEIS evaluates the potential drawdown impacts based on model simulations. While any groundwater model includes uncertainties and limitations (as discussed for this model in DEIS Section 3.3.2.8), the model used for this study constitutes a reasonable tool for estimating probable regional-scale drawdown patterns and trends over time. The numbered items of this comment are addressed below: 1) See responses WR-1 and WR-11. 2) The model reflects both points of diversion as applied for in applications pending before the Nevada State Engineer, and "distributed pumping," i.e., production wells located away from sensitive resources (to simulate the likely locations of future production wells based on current information of sensitive areas), see the simulation of scenarios report (SNWA, 2010b). The model was not designed to, and did not result in, under prediction of drawdown. 3) See responses WR-1 and WR-17. 4) See responses WR-1 and WR-17. 5) See response WR-1. 6) The impact on regional springs was based on simulated changes in spring flows, which is dependent on the drawdown in the carbonate layer. The dependence of these flows on carbonate heads is documented by equation 4-3 in Section 4.4.1 of the numerical model report (SNWA, 2009b). 7) & 8). See general response WR-2 regarding the timeframes used for the programmatic analysis. 9). The cumulative impact analysis for groundwater drawdown considers reasonably foreseeable future uses of groundwater that could overlap with drawdown impacts of the proposed Project, as described in the EIS Section 2.9.1.5. This analysis included a projection of future agricultural water use based on current consumptive uses. This was determined to be reasonable based on historical use patterns and the limited availability of non-federal land in the region.
35028-43	Use of the 10-ft simulated drawdown criterion. Uncertainties concerning the structure of the CCRP model (e.g., the incorporation of numerous horizontal flow barriers unsupported by hydrologic field observations) give rise to uncertainties in the predicted drawdowns that vary significantly from one location to another and are unrelated to the magnitude of the predicted drawdown. For example, the error in predicted drawdown (both absolute and relative) may be greater at a location where 40-ft of drawdown is predicted upgradient of an hypothesized horizontal flow barrier than at a location where 1-ft of drawdown is predicted some distance downgradient of the same hypothesized barrier. Since predicted drawdowns of all magnitudes are subject to uncertainty which varies significantly with location and is not a simple function of the magnitude of the predicted drawdown (due to the incorporation of flow barriers), predicted drawdowns which are less than 10-ft but equal to or greater than 1-ft are generally no more discountable (unlikely) than those which are equal to or greater than 10-ft. Moreover, a long-term decline in head of less than 10-ft in a source aquifer could result in a decrease in discharge at any number of springs within the potentially affected area which would be significant for a species. Because the effects of drawdown in amounts less than 10-ft but equal to or greater than 1-ft are generally neither discountable (unlikely) or insignificant, the analysis of impacts to biological resources should consider predictions of drawdown in amounts equal to or greater than 1-ft, in combination with other relevant information -- including qualitative assessments of potential impacts to the water resource in question and factors contributing to the uncertainty of the predicted drawdown (whatever the magnitude) at the location under consideration.	See response WR-1 regarding the use of the model simulated 10-foot drawdown for the programmatic analysis of potential effects to water dependant resources.

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ID	Comment	Response
35028-44	Simulated distributed pumping for the Proposed Action and Alternatives A, C, D, and E represent best case scenarios with respect to impacts to individual springs and streams and fails to reflect information which is currently available about the prospective locations of production wellfields based on exploratory drilling/testing completed to date by the Project Proponent. According to the Simulations Report (Section 3.2, p 3-2 to 3-11) and DEIS (Section 3.3.2.9), project pumping was distributed to 'minimize pumping effects' in the impact and cumulative impact simulations performed for the Proposed Action and Alternatives A, C, D, and E. The justification provided is that "This distribution reflects the adaptive management strategies that SNWA plans to use in managing the resource by redistributing pumping to minimize effects" (Simulations Report, p 3-4). However, it is clear that this is not the only criterion SNWA will use to site future production wells. Otherwise, for example, there would be no need for the targeted (and costly) exploration program initiated by SNWA in 2005. Since the production wellfields will not be sited with the sole goal of minimizing pumping effects (including impacts to springs, streams, wetlands, and local supply wells), but will also be influenced by the capacity to produce significant volumes of water at a reasonable cost, this represents a best case scenario even in the absence of information about prospective production targets. Moreover, information which is currently available about the locations of prospective production targets was not utilized in determining the distribution of simulated production wells for the distributed pumping scenarios, nor is it reflected in the locations of the simulated production wells. Specifically, significant exploratory drilling/testing has been completed by the project proponent in Spring Valley (8 exploratory well sites, 14 exploratory/test wells, 2006 to 2008), including the identification of at least three major production targets: the alluvial fan near Swallow Springs, damaged zone of the range-bounding fault on the west side of the valley opposite Sacramento Pass, and Ely Limestone in the southcentral valley floor. Exploratory drilling and testing is less advanced in Cave, Dry Lake, and Delamar Valleys: 6 test/monitoring wells were drilled in 2005, two in each basin. Yet information gleaned from exploratory drilling and testing, including the identification of several promising production targets, is not reflected in the distribution of simulated pumping for the distributed pumping scenarios. Rather, simulated production wells appear to be widely dispersed within the project basins in a way that minimizes predicted drawdown at any one location (as stated). The distribution of simulated project pumping for the distributed pumping scenarios should be a fair representation of what is known today about the potential or likely locations of future production wellfields, whatever percentage of total exploration the current exploration drilling/testing program might represent. Since the distribution of simulated project pumping for the distributed pumping scenarios is based solely on the minimization of pumping impacts, the results of the impact and cumulative impact analyses for the Proposed Action and Alternatives A, C, D, and E represent hypothetical best case scenarios with respect to the effects of pumping and fail to assess impacts to individual springs, streams, wetlands and their associated biological resources to the degree possible as part of this programmatic EIS.	Please see Gen-1 which discusses programmatic analysis and subsequent NEPA. The detail you request likely would be more appropriately addressed in subsequent NEPA.
35028-45	Actual versus simulated units of completion of SNWA production wells. The EIS should disclose that the results of the impact and cumulative impact analyses may differ significantly from actual impacts depending on the actual versus simulated units of completion and depths of completion of future SNWA production wells. Further, the EIS should disclose whether the depths and units of completion of simulated SNWA production wells, like their areal distribution, have been selected to 'minimize pumping effects' in the impact analyses (Simulations Report, p 3-2 to 3-11) and consequently represent a best case scenario with respect to predicted impacts to water resources and water-dependent resources. For example, wells completed in upper valley fill would result in less simulated drawdown than wells completed in carbonate rocks (or lower valley fill) since the storativity of upper valley fill is much greater than that of the other units in both the model and real world. Moreover, cells representing upper valley fill are underlain and bound laterally by cells representing low permeability 'upper aquitard' at a great many locations in the model (based on a careful inspection of the model cross-sections). To the degree that the completion of future SNWA production wells in upper valley fill has been over-represented in the impact simulations, the lateral extent of drawdown, or magnitude, or both have been underestimated.	As described in Section 2 of the DEIS (and FEIS); the specific location, well completion intervals, and pumping rates for water supply wells that may be constructed as part of the proposed groundwater development project were unknown at the time of the EIS study. See Standard Comment Response WR-1 regarding the approach used for the programatic level assessment of drawdown effects.

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ID	Comment	Response
35028-46	Failure to disclose the completion of simulated SNWA production wells (with ramifications for the impact analyses). The DEIS and Simulations Report (including the DVD) fail to disclose the units of completion of simulated SNWA production wells in either the distributed pumping or POD-related impact simulations. Since the storativity of upper valley fill is much greater than that of other units (in both the model and real world) and cells representing upper valley fill are underlain and bound laterally by cells representing 'upper aquitard' at a great many locations in the model, the impact simulations underestimate the lateral extent of drawdown or magnitude (or both) to the extent that future SNWA production wells have been over-represented as completed in upper valley fill. In contrast, simulated pumping from the carbonate aquifer or portions of fault damaged zones that are in hydraulic connection with the carbonate aquifer would result in greater drawdown (due to the limited storativity of carbonate rocks) and extend over greater distances (propagate through the lower carbonate aquifer unimpeded by units of 'upper aquitard'). Because the production targets identified to date by the project proponent include both the lower carbonate aquifer and the damaged zone of range bounding faults (as well as upper valley fill), and the results of the drawdown simulations are significantly effected by the choice of pumped unit, the units of completion of the simulated production wells should be disclosed. The criteria used to select the units of completion should also be disclosed, accompanied by a description of the potential effects on predictions of drawdown due to project pumping.	As described in Section 2 of the DEIS (and FEIS); the specific location, well completion intervals, and pumping rates for water supply wells that may be constructed as part of the proposed groundwater development project were unknown at the time of the EIS study. See Standard Comment Response WR-1 regarding the approach used for the programatic level assessment of drawdown effects.
35028-47	Numerous 'horizontal flow barriers' (HFBs) have been incorporated in the flow model which reflect a particular hypothesis (concept) concerning the hydraulic properties of faults and their degree of influence over the groundwater flow system. Specifically, the incorporation of over 50 'groups' of HFBs in the flow model appears to be largely based on a hypothesis that the hydraulic character of faults can be inferred from their geologic character (in view of the sparsity of calibration data). The model construction further assumes that faults, and even discontinuous collections of faults of various sizes, comprise significant hydraulic barriers (and/or conduits for flow) over many tens of miles and to great depths (including the full depth of the flow model, 10,000 ft bgs). Additionally, it has been assumed in constructing the model that many faults (or collections of faults) are comprise of both a low permeability core which impedes flow across the fault(s) and a damaged zone of enhance permeability that acts as a high-conductivity conduit for flow parallel to the fault(s), again over great distances and to depths of up to 10,000 ft bgs (at many locations in the study area). That the incorporation of HFBs has had a significant impact on the computed 'branch conductances' is evident in 1-ft contours of the predicted drawdowns. To a large degree, the model reflects a particular concept of the groundwater flow system and the model predictions are a manifestation of that concept. Predicted drawdowns presented and utilized in the DEIS represent the response of a system which is dissected by numerous barriers to lateral groundwater flow. To the extent that some, if not many, of the 50 plus faults (and collections of faults) incorporated in the model as 'horizontal flow barriers' are, in fact, not barriers to groundwater flow, actual drawdown due to project pumping may differ significantly from predicted drawdowns. The latter should be disclosed in the discussion of model uncertainties (Section 2.2.3.8) and a discussion of model uncertainties in the Executive Summary (as an addition to section ES .2).	Comment noted. See response WR-3 regarding the representation of faults in the CCRP model used in the impact analysis.
35028-48	The incorporation of over 50 HFB's has likely had a significant effect on the calibration of RMU parameters (with ramifications for the results of the impact analyses). The effects of the incorporation of the HFBs on the calibration of RMU (regional modeling unit) parameters, and consequently the impact simulations, are likely substantial, but have not been assessed or disclosed in the model reports or DEIS.	Comment noted. See response WR-3 regarding the representation of faults in the CCRP model used in the impact analysis.

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ID	Comment	Response
35028-49	The model appears to be greatly overparameterized (with ramifications for the model calibration and impact analyses). It's not clear from the Numerical Model Report, DVD, or DEIS how many parameters were optimized as part of the model calibration. A spreadsheet provided on the Numerical Model Report DVD lists over 2000 HUF package parameters (representing RMU properties) and 58 HFB parameters, in addition to drain, stream, and constant head package parameters, with no indication of how many or which parameters were model calibrated (versus assigned). A second spreadsheet lists 'non-derived' parameters (not clearly defined) that were apparently optimized using UCODE -- these number 242, also a very large number. The Numerical Model Report acknowledges that only a 'small number of parameters can be estimated' of the 'large number of parameters in the model' (p 6-45). To that end, they suggest that the optimization focused on the calibration of a set of 10 aggregate parameters 'that combined nearly all the model parameters' (e.g., 'all carbonate horizontal K parameters, all HFB parameters, all UVF horizontal K parameters, all UVF specific storage parameters - see Table 6.6), which were then used to 'raise or lower values for the entire group' during the calibration process. However, it is clear from the numerical model cross-sections that a great many different values of, for example, horizontal conductivity have been assigned to cells representing the lower carbonate RMU. At best, the relative magnitude of these values were determined prior to optimizing the aggregate 'horizontal K parameter for carbonate rocks', so that the optimization of the aggregate parameter was significantly influenced by the assignment of relative values (in addition to the minimization of residuals). At worst, the relative values themselves were optimized during some form of model calibration (not clear from the model report), in which case the calibration was even more overparameterized. In either case, the optimization is not likely to represent an optimal solution to the parameter estimation problem and no doubt reflects a large number of assigned values and (or) assigned relative values. Given the complexity of the model and likelihood of overparameterization (based on the shear number of assigned and calibrated parameters, both of which contribute to uncertainty), the optimization was likely significantly less than optimal and the results of the impact simulations should be viewed as a manifestation of a particular concept of the flow system. A clear distinction should be made between assigned and model calibrated parameters in the Numerical Model Report (and DVD). The number and nature of the model calibrated parameters should be clearly described, along with the potential consequences of overparameterization for the model predictions.	See response WR-16. Also, note that different values for some parameters, such as horizontal conductivity, have been assigned to cells representing the same rock type because the model extends over large distances and the geologic variation within some rock types is extreme. The same rock type may vary in horizontal conductivity from location to location based on factors such as the degree and character of fracturing within a localized area.
35028-50	Impact Analyses Based on Simulations of Pumping to a Maximum of 200 years after Full Build-out. A range of uncertainties affect the CCRP model predictions over all timeframes. Some model uncertainties have a cumulative effect over time (those related to the assignment or calibration of aquifer parameters and boundary conditions). Others do not. In particular, uncertainties related to potential conceptual errors in the structure of this complex (and over parameterized) model vary significantly from one location to another, affecting model predictions over all timeframes, and may or may not produce smaller errors in predicted drawdowns at earlier times. For example, the error in predicted drawdown may be as large, or larger, at a particular location at 200 years after full build-out (FBO) than at later times (in both absolute and relative terms) due to the incorporation of one or more hypothesized horizontal flow barriers and their locations relative to simulated production wells. Since predicted drawdowns are subject to errors which vary as much in space as time and model predictions indicate significant downward trends in groundwater levels and spring discharge at numerous locations as of 200 years after FBO (signaling the potential for greater impacts at later times), the effects analysis presented in the EIS should, at a minimum, disclose information which allows the reader to evaluate predicted drawdowns at 200 years after FBO in the context of the potential full effects of project pumping (i.e., the proportion of total drawdown represented by predictions of drawdown at 200 years after FBO at selected representative locations). As a practical matter, the most reliable drawdown predictions may be produced by a steady state model simulation which represents the response of the system over thousands of years (i.e., the full impacts of the project) since the latter would be independent of weakly calibrated storage coefficients and minimally affected by the incorporation of numerous horizontal flow barriers that may or may not exist.	Comments noted regarding model uncertainty. See response WR-2 regarding the timeframes used for the analysis and response to comment regarding considering model simulation steady state.
35028-51	The model cannot evaluate impacts to springs which have been omitted from the model. Additionally, some springs have been included in the model, but omitted from the impact analyses based on a priori assumptions concerning 'the likely source of water' for the spring. Specifically, some springs have been omitted from the impact analyses based on assumptions concerning the degree of hydraulic connection with the regional or a basin-scale flow system, i.e., its "susceptibility to groundwater development drawdown impacts". Significant examples include Roland Springs, Great Basin National Park.	The potential risk of flow reductions at all identified springs within the region of study were addressed in the EIS. The methodology used to evaluate the potential risk to springs was described in section 3.3.2.8 of the EIS. The potential risk to spring flow at Rowland Spring under each alternative pumping scenario evaluated as part of the programmatic assessment is provided in Section 3.3.2.9.

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ID	Comment	Response
35028-52	Underestimation of 'at risk' springs based on the 10-ft simulated drawdown criterion. The DEIS states that a minimum of 10-ft of simulated drawdown was used as a criterion in identifying 'at risk' springs. Since the discharge of many, if not all, springs in the study area would be affected by less than 10-ft of pumping-induced drawdown (e.g., 9, 5, or even 1 ft), 'at risk' springs are underestimated. For example, the rating curve for Pederson Spring in the Muddy River Springs Area suggests that a 0.5 ft reduction in spring stage (head at the spring orifice) would result in an 80 percent reduction in spring discharge and that a 1 ft reduction in stage would cause the spring to stop flowing altogether. Rating curves are not readily available for Flag Springs 1, 2, and 3. However a reduction in head of 1 to 9 ft at the orifice of Flag Spring #2 would likely result in a significant reduction in discharge of this ~2.5 cfs spring. A reduction in head of several feet would also presumably have more than a measurable effect on the discharge of larger springs such as Crystal, Ash, and Hiko Springs in Pahranagat Valley. As such, the minimum 10-ft simulated drawdown criterion is too high to reasonablely, much less conservatively, identify springs which may be susceptible to drawdown impacts as a result of project pumping. Moreover, simulated declines in the elevation of the water table (located primarily in valley fill and other surficial units) have been used to estimate potential impacts to carbonate springs, rather than predicted changes in head in carbonate units deemed to be the source of the springs. The identification of 'at risk' springs should be revised using predictions of drawdown in carbonate units deemed to be the source of the springs, respectively (specifically at the depth of the assumed source). Additionally, the 'at risk' status of springs should not be based on their location in the valley floor versus valley margin, since the latter may be equally or more connected to pumped units (i.e., depend on the location of pumping). The evaluation should be based on the magnitude of predicted drawdown at the depth of each spring source (simulated or assumed) and a rating curve for the spring (or a spring of similar size and source). For example, springs could be considered to be at moderate risk if the projected reduction in discharge is 10 to 25%, high risk if the projected reduction in discharge is closer to 50%, and very high risk if the projected reduction in discharge is ≥ 90% based on the magnitude of simulated drawdown at the depth of the assumed spring source. Whereas this would require full use of the available drawdown predictions (including predictions of drawdown which are greater than zero, but less than 10-ft), it would yield a more physically tenable and defensible result than the current treatment.	See response WR-1 regarding the use of the groundwater flow model and defining the drawdown area for the impact assessment. The potential for the proposed groundwater development to reduce flow in Muddy River Springs and Flag Springs (specifically mentioned in the comment) was evaluated using model simulated flows as described in Section 3.3.2 of the EIS.
35028-53	The model is weakly calibrated (at best) to spring and stream baseflow observations, thus a poor predictor of impacts to springs and perennial streams. The Numerical Model Report indicates that spring discharge and stream baseflow measurements were utilized as calibration data. However, the model was subsequently described by the modeling team in a cooperative agency conference call as uncalibrated to spring and stream discharge data. The Numerical Model Report (SNWA 2009b & 2010a) and EIS should accurately reflect whether spring and stream discharge data were effectively used to constrain the model calibration. To the extent that the model has not been effectively calibrated to reproduce observed spring/stream flows, or only weakly so, the model is generally a poor predictor of the impacts of project pumping on springs and perennial streams.	See response WR-18.

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ID	Comment	Response
35028-54	Reproduction of physical processes controlling spring discharge is poor (with ramifications for the impact analyses). Because the model was weakly calibrated to spring discharge and stream baseflow observations, at best, physical processes controlling spring discharge and stream baseflows are poorly reproduced by the model. Additionally, some train-and-error calibration of 'drain' and 'stream segment' locations, elevations, and conductances (used to simulate springs) was apparently undertaken in an effort to reproduced documented spring discharges and known water quality parameters such as temperature and age. But the structure of the model (configuration of RMUs), aquifer parameters for RMUs, and distributed recharge were apparently not calibrated to any meaningful degree as part of this effort. As such, physical processes controlling the location and rate of discharge of specific springs are generally poorly reproduced by the model as indicated by the failure of the calibrated model to reproduce observed discharges at many of the modeled springs, as well as the numerous springs which have been removed from the model in the last year due to the difficulty of reproducing their flows. Moreover, the annual mean discharge of several large springs (Hiko, Crystal, Ash and the hypothetical aggregate spring representing the Muddy River Springs) are approximated by the calibrated model, but it is not clear from the documentation whether this was achieved through manipulation of stream package parameters alone (e.g., streambed elevations and conductances) or indicative of the reproduction of salient physical processes controlling the occurrence and discharge of these springs. If the former, then the model is likely a poor predictor of impacts to Hiko, Crystal, Ash, and the Muddy River Springs, even though the annual mean discharges of these springs are reproduced by the calibrated model. To improve the reproduction of physical processes controlling spring discharge and the capacity of the model to predict pumping impacts to springs, consider using standard model calibration and the superposition approach iteratively to calibrate the model. Specifically, it might be possible to use standard model calibration runs to elucidate physical processes which control the occurrence and discharge of individual springs (this would include optimizing the structure of the model, RMU parameters, and distributed recharge in addition to drain and/or stream package parameters), followed by superposition runs to constrain the calibration of RMU aquifer parameters (apart from the effects of errors in modeled spring discharges, ET, and areally distributed recharge). The benefits of this approach would be analogous to iterating between steady and transient model calibration runs to ensure that model-calibrated storativities (which can only be optimized during transient calibration and are influenced by model-calibrated conductivities/transmissivities) are effectively constrained by conductivities/transmissivities which are also calibrated to steady data.	See response WR-18. The use of the superposition approach to represent spring flows was considered late in the modeling process and discussed with the Hydrological Technical Review Team. The acceptable calibration to spring flows did not warrant revision of the model, thus BLM concluded that the superimposition modeling (recommended in the comment) was not necessary. Also, see response WR-10.
35028-55	Descriptions of predicted impacts to springs and streams. Because the text of the resource chapters is lengthy and will likely not be read in their entirety by the public, sections describing impacts to specific water resources, for example Impacts to Springs and Streams, should reiterate that predicted impacts are based on model simulations which are subject to uncertainties described in Section 3.3.2.8. Consider modifying the opening text of such sections to something like: "Estimates of the potential risk to springs based on model simulations of drawdown due to the Proposed Action are presented in Figures X, Y, and Z for times corresponding to full build out, 75 years after and 200 years after full build out, respectively. This and other model simulations preformed for the EIS are subject to uncertainties described in Section 3.3.2.8. The model used to perform the simulation is described in Section X." Additionally, Table 3.3.2-6 (and similar tables) describe potential impacts to springs in terms such as 'X number of 'inventoried springs' are located in areas where impacts to flow could occur, Y number of 'other springs' are located in areas where impacts to flow could occur'. This fails to convey the number of springs impacted in any one valley (essentially the distribution and magnitude of the impacts). Absolute numbers of impacted springs do little to provide the reader with an understanding of the extent of the predicted impacts within a basin or region, unless the reader knows the total number of springs in the area (or more specifically the total number of springs in hydraulic connection with the regional or a basin-fill aquifer). Also, the meaning of 'inventoried spring' (e.g., in Table 3.3.2-6) is unclear unless the reader has located the definition earlier in Water Resources sub-chapter. ‘ Inventoried' could mean inventoried for this project/EIS. A footnote should be added to tables referencing 'inventoried springs' with the definition. Also, sections describing impacts to springs (and stream baseflows) should include text which describes the predicted impacts in 'plain English', basin by basin, and a description of the relative magnitude of those impacts instead of relying on tables or figures, e.g., 25% of all springs in Spring Valley which are supplied by the regional or basin-scale aquifer are predicted to be at risk at full build out, 50% after an additional 75 years of project pumping, and 75% at full build out plus 200 years of pumping, etc.. This summary text should be reiterated in the Executive Summary.	Your suggestions have been carefully considered by the BLM, but have not resulted in changes to the analyses presented in this document. A description of model uncertainty and limitations is provided in Section 3.3.2.8 that precedes the description of potential impacts to water resources associated with long-term pumping provided in Section 3.3.2.9 and subsequent sections. Providing additional text to describe uncertainty is not necessary and would increase the length of the water resources impacts evaluation descriptions. The requested basin by basin disclosure of water resources that could potentially be impacted for each of the pumping scenarios is provided in Appendix F3.3. The terms “inventoried” springs” and “other” springs used to describe the spring database sets used for the EIS analysis are described in section 3.3.1.4.

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ID	Comment	Response
35028-56	The application of different methods to assign ET to different portions of the model domain undermines confidence in the model calibration and model predictions. A combination of methods was used to assign groundwater ET (ETgw) to various portions of the model domain, some changed mid-stream during the analysis (Conceptual Model Report, Sections 7.1.8.1 and F.1.1.3). Uncertainties in the distribution of assigned ETgw, in turn, create a cascade of potential effects which have not been adequately disclosed in the model reports or DEIS. Specifically, uncertainties in the distribution of assign ETgw have the potential to significantly effect the optimization of recharge efficiencies, optimization of outflows at the lateral model boundary, initial and final estimates of distributed recharge, model-calibrated conductivities (transmissivities), model-calibrated diffusivities and storage coefficients, and finally model predictions about the location, magnitude, and timing of drawdown due to project pumping. Whereas an attempt has been made to characterize uncertainties in the distribution of assigned ETgw, the stochastic treatment provided is based on poor quality mean values and variances, so of little practical significance. Moreover, the effects of these uncertainties on the model calibration and drawdown predictions have not been assessed.	ETgw refers to the groundwater component of evapotranspiration which was determined using a common scientifically valid approach in combination with actual field data and satellite imagery where available. See Arnone et al. 2008; Devitt et al. 2008; Fenstermaker et al. 2011; Moreo et al.2007; and Shanahan et al. 2011. The determination of ETgw has only recently been employed in a small number of studies within Nevada. As with any data there are uncertainties in the final ETgw numbers. Recent analysis of longer term data by SNWA has shown that the ETgw numbers for Spring Valley for example may be even larger but would still fall within the range provided in the conceptual model report (SNWA, 2009a). The limiting factor in determining ETgw is not the analytical, but the physical observations for this data. There are very few ET data that have been developed for the basins within the model domain. Where data are available, SNWA has the longest period of record monitoring program within Nevada. However, the period of record is only 5 years. Additional data will be collected as time goes on. These data will be used in future groundwater modeling, for future NEPA analyses. As stated in the Draft EIS, Section 3.3.2.8, “The BLM recognizes that refinements, such as the collection of additional site-specific hydrologic information and model refinement (such as development of embedded models in specific areas of interest) will be necessary to improve the ability to predict drawdown impacts at a more localized scale.” Also see response WR-19 regarding estimation and distribution of recharge.
35028-57	Method used to estimate predevelopment boundary fluxes and the initial distribution of recharge with ramifications for the final distribution of recharge, model calibration, and results of the impact analyses. Predevelopment boundary fluxes were optimized across ~15 segments of the lateral model boundary, in conjunction with recharge efficiencies, using the groundwater balance method and a spreadsheet optimization routine, one flow system at a time. The reason for performing the optimization one flow system at a time is not provided in the model reports -- flow systems represented by the model extend over 100 miles from north to south over a variety of geologic terrains and climatic conditions. Whereas the optimization of recharge efficiencies must be constrained by estimates of discharge (using the modified Maxey-Eakin method), it was equally possible to constrain the optimization over subsets of the model domain where the geology of high-altitude recharge areas and climate are similar. By performing the optimization one flow system at a time, different recharge efficiencies have been estimated for each flow system, with significant differences from one flow system to another which may or may not represent actual differences in recharge processes. Rather, differences in the estimated recharge efficiencies may be due to differences in the quality of ETgw estimates for any particular area (see previous comment), the validity of conditions prescribed on the lateral model boundary, internal interbasin flow constraints imposed on the optimization for each flow system, and the degree to which the solution for each flow system represents an optimal solution to this inherently nonidentifiable problem. A reason should be provided in the Numerical Model Report for optimizing recharge efficiencies one flow system at a time. Future updates of the model should include an optimization of recharge efficiencies over areas of similar geology and climate to see what bias the flow system-by-flow system approach may have introduced to the initial assignment of distributed recharge, which influenced the calibration of aquifer parameters and consequently the results of the impact simulations. An effort has been made to characterize uncertainties in the optimized recharge efficiencies. However, the stochastic treatment provided is based on poor quality mean values and variances, so of little practical significance. Moreover, the effects of these uncertainties on the model calibration and drawdown predictions have not been assessed.	External boundary fluxes (flow into or out of the groundwater flow model domain) were estimated independently, not in conjunction with recharge efficiencies (SNWA, 2009b, p. 3-3). See response WR-23 regarding external boundary fluxes and WR-19 regarding estimation and distribution of recharge.
35028-58	Calibration of areally distributed recharge. The Numerical Model Report indicates that the percentage of total groundwater recharge which occurs as 'runoff recharge' was model calibrated prior to redistribution along 'runoff pathways' (Numerical Model Report, p 4-71). However, "large simulated hydraulic head residuals in recharge areas" were interpreted as being due to 'perched conditions' (measurements from wells completed in 'perched' units). The extent to which head residuals in recharge areas were discounted should be clarified to avoid the impression that the distribution of recharge was not effectively model calibrated. Additionally, the effects of uncertainties in the distribution of groundwater recharge on the remainder of the model calibration and drawdown predictions has not been assessed or adequately disclosed in the model report(s) or DEIS.	The percentage of total groundwater recharge that runs off was estimated prior to redistribution along runoff pathways (SNWA, 2009b). Page 4-71 of the numerical model report lists the relationship between rock type and the fraction of in-place recharge. These were adjustable parameters during calibration. Large head residuals in recharge areas were assigned lower weights because they reflect a flow system that was not included in the model as recommended by Hill and Tiedeman, 2007. The unweighted residuals were provided in Figure 6-9 of the numerical model report (SNWA, 2009b). This figure shows that the larger residuals are located on the alluvial fans and in the mountain blocks as would be expected.

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ID	Comment	Response
35028-59	The calibration datasets are sparse (with ramifications for the calibration of the model and results of the impact simulations). The steady calibration dataset (which represents pre-development conditions) is limited to 57 pre-1945 groundwater level measurements, no stream discharge observations, and a large number of 'regional' and 'intermediate' spring discharge measurements which, however, were collected over a range of years, including recent years (post-2000, Numerical Model Report, Section B.4.1). The transient calibration dataset (which represents 1945 - 2004 conditions) is comprised of numerous groundwater level data, several hundred of which were collected at locations 'near' pumping. However, few of the available groundwater level records show a response to pumping and are comprised of more than a few measurements, and most are likely from shallow wells completed in upper valley fill. Additionally, groundwater level data exhibiting climate-induced fluctuations where included in the transient calibration dataset even though boundary conditions imposed during the transient calibration were themselves steady (not intended to account for climatic fluctuations). Moreover, Section B.4.2.1 indicates that the model was calibrated to reproduce zero change in discharge from 1945 - 2004 at 11 major springs: Big Springs and Gandy Warm Springs in Snake V; Preston Big Spring and Hot Creek Spring in White River Valley; Ash Springs and Crystal Springs in Pahranagat V; Muddy Springs, Pederson Spring, and Pederson East Spring in the Muddy River Springs Area; and Rogers Spring and Blue Point Spring in the Black Mountain Area. That is, discharge at these springs was assumed to be steady (unchanged) throughout the historical development period (1945 - 2004), despite the advent of irrigation pumping in the 1940's. To the extent that some of these springs may have experienced pumping-induced declines from 1945 to 2004 which were unaccounted for during the transient calibration, spring 'drain' or 'stream' (package) conductances may have been underestimated, resulting in an underestimation of impacts to spring discharge in the pumping simulations. The reason given for imposing 'zero change in discharge' conditions at these springs was that available continuous spring discharge records for these sites, none longer than 11 years (of the 69 year transient calibration period) and most 1 to 4 years in length, showed no obvious declines. Transient streamflow calibration data were limited to the Muddy River, the end of Lake Creek, and end of Pahranagat Wash. The transient calibration did not include transient spring discharge observations. Given the limited quantity and quality of the calibration datasets, the model is weakly calibrated, at best. This, in turn, gives rise to significant uncertainties in the impact simulations which have not been adequately assessed or disclosed.	A summary of the historical baseline flow data for major regional springs was provided in the baseline characterization report (SNWA 2008). Supplemental information on spring flows for the northern portion of the study area is provided in the BARCAS report (Welsh et al. 2007) and in the USGS NWIS database. Available historical flow data for major regional springs in the study area is variable from one spring to another. The period of record for these springs often contains published flow estimates from early in the 1900's; with more regular flow estimates over the past several decades. The spring flow dataset generally shows that the flows from major regional springs have remained relatively consistent over the baseline period (1940-2004). Therefore, the assumptions used for model calibration were reasonable and supported by field measurements. Climate-induced changes in water levels were removed from the calibration data on a well by well basis before using the data for calibration because boundary conditions of the model did not include climatic fluctuations. The process of removing climate-induced changes is described in Appendix B, Section B.4.2.3.5, of the numerical model report (SNWA, 2009). Also see response WR-15
35028-60	Weak calibration of specific yield and specific storage values (with ramifications for the results of the impact analyses). Specific yield and specific storage values for the major aquifer units (RMUs) are weakly calibrated, at best, due to the limited information content of available transient calibration data (necessary to calibrate specific storage and specific yield values). Groundwater level data utilized in the transient calibration represent numerous locations. However, very few of these records are of any length and only a subset of those reflect a transient response to pumping (as opposed to climatic fluctuations). Additionally, few transient calibration data are available for lithologies other than upper valley fill (i.e., carbonate rocks). Model calibrated specific yield and specific storage values, in turn, have a significant effect on the magnitude, areal extent, and timing of predicted drawdowns. This limitation should be disclosed in the EIS (Section 2.2.3.8) and numerical model reports.	All available data were used to calibrate the model. It would be desirable to have more transient data closer to areas of pumping such that they exhibit impact, but such data cannot be obtained after the fact. The DEIS states in Section 3.3.2.8 "Although there are uncertainties and limitations associated with results of a regional groundwater flow model over a broad region with complex hydrogeologic conditions, the calibrated CCRP model is a reasonable tool for estimating probable regional-scale drawdown patterns and trends over time." The DEIS identifies uncertainties resulting from the limited data and recognizes that refinements to the model will occur during future tiered analysis prior to pumping activities in each basin as new data are compiled. Also see WR-11, WR-15, and WR-20.
35028-61	Calibration data are too sparse to model-calibrate the conductivity (conductance) of the incorporated HFB's (with ramifications for the results of the impact simulations). The Numerical Model Report indicates that the hydraulic conductivity of most of the 50 HFBs incorporated in the model were model-calibrated (Numerical Model Report, Table 5-3). Specifically, they were described as "tested during model calibration" (p 5-10). This despite an earlier statement that "Practically no data are available to accurately identify the role of the faults present in the model domain" (p 3-4). The density and distribution of calibration data (shown in Figures 2-1 and 2-2 of the addendum to the Numerical Model Report) are clearly insufficient to model calibrate the conductivity (conductance) of any of the HFBs at any particular location. Even more clear, the calibration data are not sufficient to model calibrate conductivities (conductances) for high and low permeability HFB components over the hypothesized distances and depths. Additionally, only the final values of HFB conductances provided in Table 5-3, making it difficult to assess the extent to which the initial assignment of conductances were in fact modified during the calibration process. Conductances associated with the various HFBs, including their subcomponents, appear to be largely assigned, rather than model calibrated, and reflect a particular hypothesis (concept) concerning the hydraulic properties of faults, and even collections of faults, based on their characteristics as geologic structures. As such, the impact analyses are a manifestation of a particular hypothesis concerning the hydraulic character of a large number of individual faults within the project area. In contrast, the hydraulic character of faults is widely understood within the hydrologic community to vary from fault to fault, with location along any given fault, and with depth in individual fault zones (as acknowledged in the DEIS (Section 3.3.1.5). Uncertainties arising from the assignment of conductances to these discrete model structures has not been adequately assessed or disclosed in the model reports or DEIS.	All available data were used to calibrate the model. It would be desirable to have more transient data closer to areas of pumping such that they exhibit impact, but such data cannot be obtained after the fact. Although there are few geologic or aquifer test data from wells that penetrate faults that act as barriers, hydraulic head data reveal their presence and can be used to calibrate their properties. For this reason, some of the fault barriers that were suspected to exist during the conceptual modeling phase were assigned properties during calibration that removed the increased resistance to flow from the model. See general Response WR-3 regarding the representation of faults in the groundwater flow model, WR-10 regarding multiple representations of a system, and WR-15 regarding sparsity of data.

Comments and Responses - Federal Government

ID	Comment	Response
35028-62	Inadequacy of the uncertainty analyses. Kh values equal to 1.5x the calibrated Kh values and an Sy for upper valley fill (UVF) of 0.10 was used to approximate the maximum extent of drawdown due to Alternative A pumping. This was compared to drawdown simulated using the calibrated model (which was considered to yield the minimum extent of drawdown) in an effort to assess the effects of parameter uncertainty on the spatial extent of the drawdown predictions. Whereas 0.10 is a reasonable lower bound for the Sy of UVF, the range of values tested for Kh do not reflect the plausible range of values for the conductivity of the major RMUs at the scale of the model simulations. The rationale provided for testing an upper bound of 1.5x was that the test values should represent 'the uncertainty on the mean values', rather than 'the range of spatial variability', for major RMUs (Simulations Report, p 5-2). Whereas it would be inappropriate (excessive) to test a range of variability corresponding to a very small scale (e.g., sub-packer test), it's 100% appropriate to test a range of variability corresponding to the scale of the model simulations (conservatively the scale of the model cells), which can be approximated by a constant rate pumping test. Appendix C of the Conceptual Model Report (Table C-1) summarizes Kh's compiled from field tests conducted over a range of scales, including constant rate pumping tests. Whereas the maximum estimate of Kh recorded for fractured carbonate rocks at the scale of a constant rate pumping test may be anomalously high (e.g., ~10-2 m/s which is 3 orders of magnitude greater than the mean of 10-5 m/s), it would be conservative to test 5x the calibrated values in order to simulate a half an order of magnitude increase in Kh overall in the UC/LC RMU. Likewise, the maximum estimate of Kh compiled for UVF at the scale of a constant rate pumping test may be anomalously high (e.g., ~10-2 m/s which is 2 orders of magnitude greater than the mean of 10-4 m/s), but it would be conservative to test 5x the calibrated values in order to simulate a half an order of magnitude increase in Kh overall in the UVF RMU. The current uncertainty analyses likely greatly underestimate the range of potential drawdown due to pumping by utilizing 1.5x the calibrated Kh values for the RMUs. This notwithstanding, increases in RMU conductivities above the tested values produced large residuals (reduced the model fit compared to the calibrated model). This result suggests that the model is overconstrained by the incorporation of 50 plus 'horizontal flow barriers', with significant ramifications for predicted drawdowns, and should be addressed in the discussion of model uncertainties (Section 3.3.2.8 and model reports SNWA 2009b, SNWA 2010a, and SNWA 2010b).	Much of this comment is addressed by WR-11. Changing hydraulic conductivities by a factor of 5 instead of 1.5 when evaluating the high diffusivity case would be too extreme for evaluating sensitivity to diffusivity. Such a large change would require a recalibration of the model to accommodate the higher conductivities. Obtaining calibration with higher layer hydraulic conductivities would require lower conductivity HFBs and/or higher recharge which would in turn result in increased model outflows that would not be consistent with field measurements. Testing a range of hydraulic conductivity corresponding to the scale of the model cells would not represent the variability of effective K of an RMU.
35028-63	Clarification of drawdown figures and plates. Section 4.2.1 of the Simulations Report (p 4-5) states that drawdown maps (in the Simulations Report) show the 'simulated effects of pumping on the water table'. This also presumably applies to 'drawdown figures' provided in the DEIS. However, the latter are ambiguously labeled 'predicted changes in groundwater levels'. Drawdown maps which depict predicted changes in the elevation of the water table should be clearly labeled as such. The Simulations Report and EIS should also include contour maps of predicted drawdown in the regional carbonate aquifer (e.g., vertically averaged drawdown in the active portion of the regional flow system) to facilitate the evaluation of impacts to springs supplied by the carbonate aquifer and more completely convey the propagation of regional impacts.	Regional springs drawing water from the carbonate aquifer are represented as spring discharges and the changes in discharges facilitate evaluation of impacts and have been presented in the EIS and section 4.4.1 of the simulations report (SNWA, 2010b).
35028-64	Depiction of predicted drawdown as it relates to the usability of the impact simulations. Simulated drawdown is currently depicted to a minimum of 10-ft in the Simulations Report and DEIS. However, many, if not all, springs in the study area would be substantially impacted by less than 10-ft of pumping-induced drawdown (e.g., 9, 5, or even 1 ft) -- see previous comment titled 'at risk' springs. Consequently, lesser levels of drawdown are relevant to the evaluation of impacts to springs, as well as perennial streams and wetlands. Yet it is impossible to extrapolate from the 10-ft drawdown contours provided in the DEIS to lesser, but environmentally relevant, levels of drawdown with the mind's eye due to the complexity of the hydrogeologic system and generally logarithmic decrease of drawdown with distance. Consequently, simulated drawdowns should be depicted to a minimum of 1 ft, with an additional contour at 5-ft, accompanied by an adequate disclosure of the uncertainties. The reviewer acknowledges the 'relative error' argument, but submits that errors associated with large predicted drawdowns can also be significantly in error in a model (problem) of this complexity (e.g., a prediction of 5-ft of drawdown may be 20-ft in error due to the inclusion of a particular HFB).	See Standard Comment Response WR-1 regarding groundwater modeling and the use of the model simulated 10-foot drawdown contour to define the drawdown area for the regional programmatic analysis.
35028-65	Disclosure of the volume of springs omitted from the model (with potential ramifications for the impact simulations). A significant number of springs have been omitted from the flow model. To the extent that the volume of springs omitted is significant compared to total discharge in the model domain (ET + spring discharge), or compared to total discharge in individual basins comprising the model domain, the pumping simulations likely overestimate the capture of ET and interbasin flows (which are adequately represented in the model) and systematically underestimate the capture of discharge from springs (which are under-represented in the model), even at springs which have been included in the model. The Numerical Model Report and DEIS should include a description of the volume of springs omitted from the model (due to difficulties in reproducing their flows) and their collective magnitude relative to the water budget for all basins comprising the model domain, individual basins within the model domain, and flow systems represented by the model, so that any such bias is disclosed and can be assessed.	It is not appropriate to include the many small, local, springs due to the regional character of the model. Such springs are sourced by perched water tables that are not connected to the principal aquifers where groundwater production will occur so the perched aquifers were not simulated in the model. Inclusion of perched aquifers in the model would be difficult and would not affect predicted impacts. For example, inventoried average flow from these springs totals 9,500 AFY which is less than 1.5% of the annual inflow of 645,300 AFY in the simulation of current conditions (year 2004) by the numerical model (SNWA, 2009b). Springs that were too small to be specifically modeled, but that may have had a connection to aquifers located within ET regions had their flows accounted for by ET drain cells. Inventoried average flow from these springs totals 35,000 AFY. This process is described in Section 4.4.4 of the model report (SNWA, 2009b).

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ID	Comment	Response
35028-66	The impact analyses likely overestimate the capture of ET and underestimate the capture of spring discharge in areas where modeled springs are located in 'low-relief' ET areas (e.g., valley floors). The majority of springs represented in the model have been incorporated as MODFLOW 'drains'. ET has also been simulated in the model using 'drains'. ' Drain' elevations assigned to springs in 'low-relief' areas (presumably valley floors) are lower than 'drain' elevations assigned to ET in the same areas. Specifically, spring 'drains' everywhere are assigned an elevation equal to the minimum elevation within the cell of the spring (based on a 30-m DEM), minus 10 m; while ET 'drains' in 'low relief' areas are assigned an elevation equal to the average elevation within the cell (based on a 30-m DEM), minus 5 m. Consequently, the model tends to overestimate the capture of ET and underestimate the capture of spring discharge in these important areas as the elevation of the water table (or head) drops in response to simulated pumping.	As described in section 4.4.4.1 of the numerical model report (SNWA, 2009b), the configuration of springs and ET using the Drain Package was used as a practical solution to address the natural setting where springs and ET occur in the same model cells. The 15 regional or intermediate springs of critical concern are represented either with the SFR package or as drains that are not surrounded by significant ET areas. The situation described in this comment occurs at locations of small local to intermediate discharge springs. These smaller springs cannot reasonably be simulated individually given the regional scale CCRP model. The distinction between capturing diffuse ET and these small spring discharges is not important for this regional-scale model because an area is classed as affected if discharge declines. Also diffuse ET and spring discharge are muddled in the field because spring discharge creates a wet, marshy area. Diffuse groundwater discharge could be occurring in the wet, marshy area but cannot be differentiated from the spring flow given current field techniques. This is why the USGS estimates groundwater discharge by mapping ET units that include vegetation fed by spring discharge. Spring discharges serve as an internal check, but groundwater discharge equals total ET minus local precipitation. The procedure for calculating discharge to drains is described by equation 4-3 in Section 4.4.1 of the numerical model report (SNWA, 2009b). When the head in the cell declines, a smaller head difference is used for both the ET and the spring drain, so discharge will decline for both ET and the spring. It is only during the time of the last 5m of drawdown before spring flow ceases that ET will cease and the spring will continue to flow. This is consistent with anticipated field conditions where it is likely the perimeter of ET areas will shrink towards the spring discharge locations.
35028-67	Predictions of impacts to Hiko Spring. Hiko Spring appears to discharge from a fault which is exposed in outcrop above the spring outlet (carbonate rocks of the Lower Carbonate Aquifer). However, this fault has been simulated in the model as a 'horizontal flow barrier' (HFB), 25 miles in length, and the spring is simulated as discharging ~0.6 miles (or one model cell) to the west. As a result, Hiko Spring is sheltered from the propagation of drawdown in pumping simulations by this, as well as three other north-trending HFBs which have been incorporated in the model between the spring and Delamar and Dry Lake Valleys. Specifically, four HFBs have been incorporated in the model between the simulated location of Hiko Spring and simulated locations of SNWA production wells in Delamar and Dry Lake Valleys: the first at the actual location of Hiko Spring; a second ~6 miles east of the first (which is 30 miles in length and coincides with a discontinuous collection of faults ranging in size from regional to minor); a third ~6 miles east of the second (which is 35 miles in length and coincides with a regional-scale normal fault inferred at the boundary between Pahranagat and Delamar Valleys and north into Pahroc Valley); and a fourth ~7 miles east of the third (which is 50 miles in length and coincides with a range-bounding fault inferred on the west side of Dry Lake Valley, then a strike-slip fault extending NNW into northern Pahroc Valley). At 200 years after FBO, simulated drawdown for Alternative A (proposed project pumping at previously approved rates) is significantly reduced across this series of hypothesized flow barriers (i.e., reduced by roughly 20, 10, 5, and finally 1 ft across each hypothesized structure from east to west), so that the predicted drawdown at Hiko Spring after more than 200 years of project pumping is < 1 ft [based on simulated drawdown contours provided by SNWA to a minimum of 1-ft]. However, available calibration data (groundwater level measurements) are not sufficient to confirm the presence of these structures as 'horizontal flow barriers' (see the distribution of calibration data, Figures 2-1 and 2-2 of the Addendum to the Numerical Model Report), nor are they sufficient to model-calibrate conductivities (conductances) for any of the four structures, at any location, or confirm the proposed uniformity of hydraulic properties over distances of 25 to 50 miles. To the extent that one or more of these faults (or collections of faults) are not significant barriers to groundwater flow, or the actual faults possess hydraulic properties which differ from those assigned in the flow model, or the faults do not constitute continuous barriers to groundwater flow over the proposed distances, drawdown at Hiko Spring due to project pumping could be significantly greater than that predicted by the model. The effects of these HFBs on predictions of impacts to Hiko Spring have not been assessed or adequately disclosed in the DEIS. Hiko Spring is an important source of water for Pahranagat National Wildlife Refuge.	See responses WR-3 regarding the representation of faults in the groundwater flow model; WR-21 regarding structures in the vicinity of Hiko, Crystal, Brownie, and Ash Springs; and WR-10 regarding model development.

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ID	Comment	Response
35028-68	Predictions of impacts to Crystal Springs. Crystal Springs has similarly been simulated as discharging ~0.6 miles (or one model cell) west of its actual location, and west of the four HFBs described above (see comment concerning Hiko Spring). Simulated drawdown for Alternative A (proposed project pumping at previously approved rates) is significantly reduced across this series of hypothesized flow barriers, so that the predicted drawdown at Crystal Springs after more than 200 years of project pumping is < 1 ft [simulated drawdown contours provided by SNWA to a minimum of 1-ft]. However, available calibration data (groundwater level measurements) are not sufficient to confirm the presence of these structures as 'horizontal flow barriers' (see the distribution of calibration data, Figures 2-1 and 2-2 of the Addendum to the Numerical Model Report), nor are they sufficient to model-calibrate conductivities (conductances) for any of the four structures, at any location, or confirm the proposed uniformity of hydraulic properties over distances of 25 to 50 miles. To the extent that one or more of these faults (or collections of faults) are not significant barriers to groundwater flow, or the actual faults possess hydraulic properties which differ from those assigned in the flow model, or the faults do not constitute continuous barriers to groundwater flow over the proposed distances, drawdown at Crystal Springs due to project pumping could be significantly greater than predicted by the model. The effects of these HFBs on predictions of impacts to Crystal Springs have not been assessed or adequately disclosed in the DEIS. Crystal Springs is an important source of water for Pahranagat National Wildlife Refuge.	See responses WR-3 regarding the representation of faults in the groundwater flow model; WR-21 regarding structures in the vicinity of Hiko, Crystal, Brownie, and Ash Springs; and WR-10 regarding model development.
35028-69	Predictions of impacts to Brownie and Ash Springs. Like Hiko and Crystal Springs, Brownie and Ash Springs are located west of the four HFBs described above. Simulated drawdown for Alternative A (proposed project pumping at previously approved rates) is significantly reduced across this series of hypothesized flow barriers, so that the predicted drawdown at Brownie and Ash Springs after more than 200 years of project pumping is < 1 ft [simulated drawdown contours provided by SNWA to a minimum of 1-ft]. However, available calibration data (groundwater level measurements) are not sufficient to confirm the presence of these structures as 'horizontal flow barriers' (see the distribution of calibration data, Figures 2-1 and 2-2 of the Addendum to the Numerical Model Report), nor are they sufficient to model-calibrate conductivities (or conductances) for any of the four structures, at any location, or confirm the proposed uniformity of hydraulic properties over distances of 25 to 50 miles. To the extent that one or more of these faults (or collections of faults) are not significant barriers to groundwater flow, or the actual faults possess hydraulic properties which differ from those assigned in the flow model, or the faults do not constitute continuous barriers to groundwater flow over the proposed distances, drawdown at Brownie and Ash Springs due to project pumping could be significantly greater than predicted by the model. The effects of these HFBs on predictions of impacts to Brownie and Ash Springs have not been assessed or adequately disclosed in the DEIS. Ash Springs is an important source of water for Pahranagat National Wildlife Refuge.	See responses WR-3 regarding the representation of faults in the groundwater flow model; WR-21 regarding structures in the vicinity of Hiko, Crystal, Brownie, and Ash Springs; and WR-10 regarding model development.
35028-70	Predictions of impacts to Pahranagat National Wildlife Refuge. The model construction reflects the assumption (articulated in the Conceptual Model Report, page 7-48) that wetlands in Pahranagat Wash (Pahranagat National Wildlife Refuge) are maintained by discharge from Hiko, Crystal, and Ash Springs which are located north of the refuge; more specifically that wetland phreatophyte communities within the Wash are 'supported by a shallow alluvial aquifer which is recharged by the regional springs' (Hiko, Crystal, and Ash Springs) [Numerical Model Report, pages 4-53 to 4-58]. Moreover, the model construction reflects the assumption (described on p 4-57 of the Numerical Model Report) that the shallow alluvial aquifer underlying Pahranagat Wash from Ash Springs to the Pahranagat Shear Zone is 'perched or semi-perched'. Specifically, low permeability layers (~10-8 m/s conductivity) have been incorporated in the model beneath the area of the refuge (the full length of the Wash and width of the riparian zone) which are not explicitly disclosed in the text but clearly evident in the numerical model cross-sections. This despite a lack of data supporting the presence of perched or semi-perched conditions in the vicinity of the refuge (Numerical Model Report, p 5-21, "no data are available to support it"). The effect of these low permeability layers is to preclude any significant drawdown of the water table in the vicinity of the refuge in response to the propagation of drawdown from Delamar Valley in the pumping simulations. Significant changes in the elevation of the water table can only be simulated at the refuge to the extent that changes in the discharge of Hiko, Crystal, and Ash Springs (assumed to be the sole sources of water to the refuge) are predicted by the model. This, in turn, is unlikely given the incorporation of the four HFBs discussed above (see comments for Hiko, Crystal, and Ash Springs). As a consequence, the current impact analyses predict that drawdown will propagate southwest through the Pahranagat Shear Zone due to pumping at SNWA production wells in Delamar Valley (and Dry Lake and southern Cave Valleys), but the elevation of the water table will be little changed in the immediate area of the refuge (specifically ≤ 1-ft in the southern half of the refuge at full 200 years after FBO in Alternative A). The Numerical Model Report should disclose the incorporation of low permeability layers and the lack of data confirming the existence of perched or semi-perched conditions in the area of the refuge, as well as uncertainties associated with the incorporation of the flow barriers. It seems likely that the current impact analyses significantly underestimate the potential impacts of project pumping in Cave, Dry Lake, and Delamar Valleys on the refuge.	The difficulties encountered in modeling the large groundwater discharges from springs in the northern portion of the valley while maintaining hydraulic heads below the land surface in the southern portion of the valley are discussed in Section 5.4.2 of the numerical model report (SNWA 2009b). The model framework was set up specifically to allow for more ET to discharge from the southern portion of the basin. The BLM anticipates that the model representation of the groundwater flow system in southern Pahranagat will likely be refined as additional site characterization data becomes available for this area. Also see responses WR-3 regarding the representation of faults in the groundwater flow model and WR-21 regarding structures in the vicinity of Hiko, Crystal, Brownie, and Ash Springs. To clarify, the quote from page 5-21 indicates that there are no geologic data or hydraulic test results to support the low hydraulic conductivity layer. The head and spring discharge data support the presence of a feature as described in the numerical model report. The model construction is one approach to matching the observations. Alternative conceptual models may also support these observations. See WR-10 regarding model development.

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ID	Comment	Response
35028-71	Predictions of impacts to northern Cave Valley and adjacent portions of the White River Valley. The model construction includes an HFB which effectively limits the propagation of drawdown into northern Cave Valley to the cross-sectional area of a few model cells based on an inspection of the numerical model cross-sections and simulated drawdowns for Alternative A [provided by SNWA to a minimum of 1-ft]. This, in turn, greatly limits the propagation of drawdown to Flag and Butterfield Springs through Shingle Pass in the impact simulations. To the degree that this HFB does not exist, or the lateral extent or properties of the fault differ from those hypothesized in the model, the propagation of drawdown into northern Cave Valley and adjacent portions of the White River Valley, including the areas of Flag and Butterfield Springs, may be underestimated.	Comment noted.
35028-72	Predictions of impacts to Gandy Warm Springs and Leland Springs in northern Snake Valley. Simulated drawdown in potentially significant amounts may propagate to the area of Gandy Warm Springs in pumping simulations prepared for Alternative A and (or) the Proposed Action. However, this cannot be determined from the drawdown figures provided in Plates 1 and 2 of the Simulations Report or the DEIS which depict drawdown to a minimum of 10-ft.	The potential changes in flow to Gandy Warm Spring was simulated using the groundwater flow model. These model simulation results are presented in Section 3.3.2.8 of the EIS. See response WR-1 regarding the use of the model simulated 10-foot drawdown for the programmatic analysis of potential effects to water dependant resources.
35028-73	Propagation of simulated drawdown within Snake Valley. The propagation of simulated drawdown from west to east across Snake Valley appears to be impeded by low permeability 'upper aquitard', which is appropriately incorporated in the model at the approximate location of the Confusion Range Synclinorium. However, this would only occur to the extent that simulated SNWA production wells are limited to upper valley fill. If production wells (actual or simulated) are completed in the lower carbonate aquifer (near the base of the Snake Range) or in the damaged zone of the range bounding fault (at a location which is in hydraulic connection with the lower carbonate aquifer), drawdown would propagate unimpeded beneath this fold of 'upper aquitard' to the west and drawdown at the boundary between Snake Valley and Pine, Wah Wah, and Tule Valleys would be significantly greater than that currently predicted. The Simulations Model Report and DEIS should disclose whether the latter result is due to the completion of simulated SNWA production wells in upper valley fill.	See response WR-1 regarding the modeling approach for the programmatic analysis and WR-17 regarding the Distribution of pumping by lithology. A recently updated potentiometric map and report for Snake Valley and adjacent area indicates groundwater gradients and flow paths are controlled by a north south oriented band of steeply dipping Chainman Shale occurring along the east margin of Snake Valley (Gardner et al. 2011). This band of low-permeability rocks extends for nearly 60 miles from Hamlin Valley on the south to near Highway 50 in Snake Valley on the north and acts as a natural barrier to groundwater flow in the corresponding area between Snake Valley and Pine, Wah Wah and the southern portion of Tule valleys. The recognition of this lithologic flow barrier and discontinuity between water levels in Snake Valley and Hamlin Valley and conditions located east of these basins (i.e., Pine, Wah Wah and southern Tule valleys) suggest that drawdown from pumping in southern Snake Valley is unlikely to propagate into adjacent valleys located east of the CCRP model domain.
35028-74	Evaluation of impacts to Fish Springs (with ramifications for the evaluation of impacts and cumulative impacts). The model domain was extended in 2008 or 2009 to include the portion of Fish Springs Flat that comprises Fish Springs National Wildlife Refuge (NWR). However, Fish Springs has not been included in the model (or impact simulations) in a meaningful way. The model domain was extended by two cells to include the immediate area of the springs and refuge. However, Pine Valley, Wah Wah Valley, Tule Valley, the eastern portion of the Sevier Desert, and remainder of Fish Springs Flat, which are believed to contribute to discharge at Fish Springs in combination with Snake Valley [Harrill and Prudic, 1998; Prudic et al., 1995; and Prudic et al., 1993; Gates, 1987; Carlton, 1985; Gates and Kruer, 1981; and Bolke and Sumsion, 1978], have been omitted from the model. Consequently, the model cannot simulate discharge from Fish Springs in any meaningful way. Additionally, a constant head condition has been assigned to the two cells which represent Fish Springs (two boundary cells), precluding any change in groundwater level or spring discharge at the refuge during the impact or cumulative impact simulations. Whereas drawdown failed to propagate into northern Snake Valley in the current pumping simulations and predicted reductions in underflow from Snake to Pine, Wah Wah, and Tule Valleys are minimal, this may be due to the completion of simulated SNWA production wells in upper valley fill (see previous comment concerning the propagation of simulated drawdown within Snake Valley). To the extent that SNWA production in upper valley fill has been over-represented (more occurs from the lower carbonate aquifer than simulated), drawdown may propagate further north and east in Snake Valley than currently predicted. Underflow from Snake to Pine, Wah Wah, and Tule Valleys could be significantly reduced or even reversed and drawdown could propagate into Pine, Wah Wah, and Tule Valleys. This, in turn, would result in impacts to Fish Springs that cannot be simulated by the current model.	Potential impacts to flows in Fish Springs and Pine valley was addressed in Section 3.3.2 in the EIS. See response WR-5 regarding potential effects to Fish Springs; and WR-6 regarding the selection of the model boundary.
35028-75	Evaluation of cumulative impacts due to SNWA pumping in Snake Valley. Since Pine, Wah Wah, and Tule Valleys have been left out of the model, it follows that the model cannot be used to evaluate the cumulative impacts of SNWA pumping in Snake Valley and reasonably foreseeable municipal pumping in Pine, Wah Wah, and Tule Valleys (e.g., Beaver and Central Iron Counties).	See response WR-6 regarding the boundary of the model domain and evaluation of potential effects to pine, Wah Wah and Tule valleys.

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ID	Comment	Response
35028-76	Lateral Model Boundary (East Side of Snake Valley). The northeastern portion of the lateral model boundary is located on the eastern boundary of Snake Valley in the middle of the Great Salt Lake Desert Groundwater Flow System. Whereas BARCASS and numerous other studies suggest that groundwater flow is possible across this boundary (e.g., through the Confusion Range), a no-flow condition has been assigned to the majority of the boundary, with constant head conditions assigned to segments of the boundary between Snake Valley and Pine, Wah Wah, and Tule Valleys, respectively. The effect of the no-flow conditions is conservative with respect to predictions of drawdown in Snake Valley due to SNWA pumping. However, the assignment of constant head conditions is not. Even in the absence of the propagation of drawdown to the constant head boundary segments, reductions in simulated underflow to Pine ,Wah Wah, and Tule Valleys result in the underestimation of drawdown in Snake Valley. Current model simulations predict only a small reduction in underflow to Pine, Wah Wah, and Tule Valleys as a result of SNWA pumping in Snake Valley (~1100 afy in Alternative A at 200 years after FBO). However, the reduction in underflow could be significantly greater than predicted (the direction of flow even reversed), if SNWA production in upper valley fill has been over-represented in the pumping simulations (see previous comments). In this case, the effect of placing the model boundary at this location becomes even more unclear -- the model boundary should be moved east to include the whole of the Great Salt Lake Desert Groundwater Flow System in order to minimize uncertainties concerning drawdown predictions in Snake Valley and facilitate the evaluation of cumulative effects.	See general response WR-6 regarding the boundary of the model domain for the CCRP model.
35028-77	Description of Transient Calibration Data (with ramifications for the model calibration and results of the impact analyses). The documentation should include a table, either hardcopy or electronic, that describes what aquifer unit(s) groundwater level calibration data represent (the completion units and depths of wells). This is currently only provided in the form of Figure 4-40 of the 2009 Numerical Model Report, which makes no distinction between steady (< 1945) and transient (1945 - 2004) groundwater level calibration locations. This information is also not provided in the Baseline Report or on the Numerical Model Report DVD.	Appendix A Volume 4 of the baseline report (SNWA 2008) contains site numbers, station names, northing, easting, reference point elevations, site types, assigned hydrogeologic units, well depths, open intervals, number of measurements, period of record start and end dates, mean depths to water, mean elevations, and variance statistics to name a few. The analyzed data were then presented in the model report (SNWA, 2009b) without all of the additional fields already described within the Baseline Report.
35028-78	Weighting of residuals during the model calibration (with ramifications for the calibrated model and results of the impact analyses). Weights applied to residuals during the calibration of the model appear to be largely appropriate. The weights applied were the square root of the inverse of the 'variance' of calibration observations. The 'variance' of an observation was generally defined as the sum of the error in the location of the observation (within the model domain?), error in the elevation of the land surface at the location of the observation (within the model domain?), and variability of raw data used to compute the observation (e.g., the variability of groundwater level measurements used to obtain target annual average groundwater levels). These weights were applied uniformly to residuals, except for a 10x increase in the weights applied to key spring and stream flow observations which was implemented part way through the calibration process in an effort to elevate the influence of spring and stream flow observations on the outcome. If a similar increase in weights had been applied to transient groundwater level data (data showing a response to pumping, well qualifier flag '4'), the transient calibration of the model would have been improved. The latter were the most valuable groundwater level data available for the transient calibration.	The model calibration provides a good fit to the transient head observations so adjustment of weights for that type of data was not needed. Figures 6-3 through 6-8 of the numerical model report (SNWA, 2009b) provide examples of how well the model is calibrated to transient head observations. The DVD associated with that report includes a hydrograph comparing observed and simulated data for each well used as a calibration target. These are presented in a pdf file entitled “FINAL_SIM_OBS_Hydrographs.pdf” in the folder labeled “8-Simulated-Observation-Hydrographs”. Future groundwater modeling that will be considered in subsequent NEPA review will use new data as it becomes available to better calibrate the model for the purposes of analyzing proposed pumping in site-specific locations.
35028-79	We believe that the risk of impacting Federal resources on Paharanagat NWR is likely greater than disclosed in the DEIS due to CCRP model uncertainties and limitations, which are described in detail in the cover letter that accompanies these comments. On Pahranagat NWR, the resources at risk are the surface waters that are derived from Ash and Crystal Springs. Pahranagat NWR was established for the conservation of migratory birds, and the wetlands, riparian areas, and open waters on the refuge support numerous migratory bird species and their habitats, including the endangered southwestern willow flycatcher. The Service is also reintroducing the Pahranagat roundtail chub to waters on Pahranagat NWR, and northern leopard frog and White River specked dace already occur on the refuge.	Updated sections 3.3 (water resources) and 3.14 (special designations) discuss potential impacts from groundwater pumping.
35028-80	The water resources study area of the DEIS (and the CCRP model domain) should include those Hydrographic Basins east of Snake Valley in Utah (Pine, Wah Wah, and Tule Valleys, at a minimum) that are potentially interconnected and contribute flow to Fish Springs Flat. In addition, the entirety of Fish Springs Flat should be included in the water resources study area (not just the spring heads) so as to include the downstream habitats that are fed by discharge from the regional springs. This is needed in order to provide a thorough analysis of environmental effects, including indirect and cumulative effects. Under the Proposed Action, the 10-foot drawdown contour abuts directly against the Snake Valley-Pine Valley boundary by 75 years after FBO. At 200 years after FBO, the 20 to 50-foot drawdown contour abuts directly against this boundary and the 50-100 foot drawdown contour is directly adjacent to this boundary. This boundary issue occurs for all DEIS alternatives (except Alternative E), where the 10-foot drawdown contour apparently transcends the study boundary into Pine Valley. The DEIS acknowledges this cross-boundary issue, but does not provide a reasonable explanation as to why the water resources study area was truncated at the Snake Valley boundary when: 1) the entirety of other flow systems (e.g, the White River Groundwater Flow System) were included in the water resources study area and 2) the biological resources study area did include these potentially interconnected basins of the Great Salt Lake Desert Flow System.	See response WR-6 regarding the model boundary and evaluation of impacts to basins located east of Snake Valley; and WR-5 regarding the evaluation of potential impacts to spring discharge at Fish Springs.

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35028-81	As explained in our cover letter, we are concerned that BLM's use of the 10-foot drawdown contour to delineate potentially affected areas may be underestimating the aerial extent of potential impacts, given model uncertainties and limitations and the sensitivity of groundwater-dependent ecosystems to small (i.e.,<10 feet) changes in depth-to-water. For example, after over 50 years of management and monitoring at Fish Springs NWR, it is well understood that a reduction in water flows (such as those caused by only a one inch drop in spring heads) would result in substantial effects to water quality, quantity and regimen resulting in cascading impacts to wetland function and plant and animal resources across the refuge. Based on measured annual spring flows in 2010, if water levels of refuge springs were reduced by only one foot, there would be a conservatively estimated change in total average annual measured flow from 30.46 cfs to 0.13 cfs. This is a 99.57% reduction in spring flow. If spring water levels were reduced by one inch, there would be conservatively estimated reduction to 25.28 cfs, or a 17.01% reduction in spring flow. In regard to water quality alone, reduced flows would magnify the concentration gradient of salts across the refuge (as it relates to managed water delivery within the impoundment system with evapotranspiration loss), causing substantial changes to plant composition, animal abundance and diversity. For example, only the slightest increase in salinity in the refuge's already-brackish waters can result in substantial loss in aquatic invertebrate diversity since those waters are already near the limits of the tolerances of those species. In addition, changes to water temperatures may result from up-gradient removal of heated deep-carbonate aquifer water or cooler basin-fill aquifer water. These changes in water temperature could alter current biological habitat at the refuge. The refuge's thermal discharges maintain large areas of open-water habitats for wintering migratory birds and other resident and sensitive wildlife on the	Please see Standard Resource Response WR-1.
35028-82	Based on the text in ES 3.5 and ES 4, it appears that BLM management direction (established in management documents) was applied to the evaluation and mitigation of project construction and maintenance effects. It does not appear that it was applied to pumping effects, which are widespread in Nevada and Utah. Management direction relative to the effect of groundwater pumping on BLM lands and resources should be referenced and consulted in Chapter 4. Because project pumping effects will be realized in Utah BLM Districts, we recommend that the BLM reference relevant Utah BLM Resource Management Plans (e.g. House Range RMP, Warm Springs RMP and the Cedar District RMP) for management direction. The Cedar City District RMP is currently undergoing revision, however the Cedar City District has released its draft "Analysis of the Management Situation" (dated August 2011) which describes current management direction and management opportunities derived from considering the current conditions and trends. For example, under Management Opportunities, Fish and Wildlife Habitat, two goals are to "Maintain all good condition habitat areas" and "Prohibit management actions that would dewater sources". A final version of the document will be released soon (pers. comm. , Becky Bonebrake, BLM Cedar City Field Office, 9/23/2011). The final version should be referenced and consulted for management direction relative to the effect of groundwater pumping on BLM lands and resources in the Cedar City District.	Potential project pumping effects have been analyzed at a programmatic level in this FEIS. Subsequent NEPA analyses will evaluate potential impacts to Utah BLM Districts.
35028-83	The Cedar City District RMP is currently undergoing revision, however the Cedar City District has released its draft "Analysis of the Management Situation" (dated August 2011) which describes current management direction and management opportunities derived from considering current resource conditions and trends. The Area Profile section of the draft and/or final "Analysis of the Management Situation" (August 2011) for the BLM Cedar City District should be referenced for baseline and "Affected Environment" presentations in the SNWA GWD Project NEPA document. It should also be referenced for the trends it presents specific to individual resources. This information should be used in BLM's evaluation of cumulative effects for resources in Utah.	Based on the programmatic nature of the analysis of cumulative impacts in this FEIS, the BLM has determined that it is premature to reference the cited section of the Draft/Final document. That information will be reviewed, as appropriate, when subsequent NEPA tiers are addressed or when this EIS is reviewed for NEPA adequacy as the project is implemented.
35028-84	Spring Valley pumping could result in impacts to Hamlin and Snake Valleys (in Utah), as the model-predicted 10-foot contours touch into Utah for Alternative E and spread farther into Utah under Alternative D. The Spring Valley stipulation only minimally addresses these potential effects with limited hydrology and biological resource monitoring & mitigation in Utah. If BLM selects a "no snake valley" alternative as its preferred alternative, and it is determined that Utah resources not currently covered by the Spring Valley Stipulation could be affected by Spring Valley pumping, then BLM should require additional monitoring and mitigation to cover these Utah resources. This could take the form of a Snake Valley (and adjacent valleys) 3M Plan or the Spring Valley stipulation monitoring could be expanded to encompass these Utah resources.	Thank you for your comment. Please see Standard Resource Response MM-1.

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35028-85	Relative to groundwater pumping effects, the impact analysis for many terrestrial species depends on methodology decisions made in the water resources or vegetation sections of the document. For example, under the water resources and vegetation analyses, ET zones were derived and depicted on maps for the valleys where the model predicts a 10 foot+ drawdown. To determine impacts to terrestrial species from groundwater pumping, the BLM appears to say that where a species may use these ET zones, there may be impacts. This analysis is limited for species such as greater sage-grouse in Hamlin Valley, Utah. There is crucial brooding habitat and a number of leks in Hamlin Valley, Utah, but the analysis of pumping to the species is limited because there is only a small sliver of an ET zone presented for Hamlin Valley (Nevada). Clearly there are water resources that support the mesic vegetation necessary for brooding greater sage-grouse in Hamlin Valley, Utah. We recommend that the BLM look closely at those water sources and vegetation and provide an analysis of potential effects (under the proposed action and all alternatives) to those water sources, vegetation and ultimately, greater sage-grouse as a result of groundwater pumping.	The methodology for the terrestrial wildlife pumping analysis is based on assessing potential impacts to groundwater dependent habitats including not only ET basin shrubland and wetland/meadow, but also perennial stream reaches and springs. Please also see the methodology section in water section Table 3.3.2-3 for the assumptions use to evaluate potential impacts to perennial water resources located within the modeled drawdown area. There are a total of 5.14 miles of perennial stream reaches in Hamlin valley - none of which are located in areas with potential to be impacted by drawdown (see Appendix F3.3.11). Similarly, few of the springs in Hamlin valley are located in areas potentially impacted by drawdown. Appendix F3.6 includes a table for each alternative showing the percent of potential affected groundwater dependent habitats in the valleys where impacts could potentially occur. By providing the percent of the total available groundwater dependent habitat in the valley that has the potential to be impacted, the EIS discloses the valley by valley risks to habitat upon which the species depend - like greater sage-grouse. The EIS includes a new mitigation measures GW-WL-9 and GW-WL-10, Greater sage-grouse monitoring in Hamlin valley in order to further address this potential issue.
35028-86	BLM should reference and review the new USGS groundwater study titled "Conceptual model of the Great Basin carbonate and alluvial aquifer system." The document can be found at: http://pubs.usgs.gov/sir/2010/5193/.	The USGS report was reviewed and citations were added to Section 3.3 where appropriate.
35028-87	Groundwater Development for No Action: Based on the text in this paragraph, it appears that the No Action alternative was defined and modeled according to the amount of water currently pumped from agricultural, municipal, and industrial/power wells. There are two associated comments: 1) According to Figure 3.3.1-22, there are a number of other types of existing water rights including commercial, stockwatering and "other" within the basins. For Snake Valley for example, these water rights make up 183 of the total 256 according to Table 3.3.1-19. On an AFY basis, it is unclear what these rights represent. If the amount of water represented is insignificant and therefore not included, then it should be disclosed in the text of the document. If the amount of water is significant, it should be included in the No Action alternative definition and modeling. 2) Figure 2.2-1 indicates that there are no existing industrial, municipal or irrigation groundwater rights within Hamlin Valley. Table 3.3.1-19 indicates that there are. These water rights should be included in the No-Action alternative modeling or a rationale should be given for excluding them.	As stated on Page C-7 of the Transient Numerical Model of Groundwater Flow for the Central Carbonate-Rock Province: Clark, Lincoln, and White Pine Counties Groundwater Development Project report (SNWA, 2009b), “Stock watering and self-supplied domestic uses were excluded because their consumptive water use is relatively small compared to the other manners of use in the study area.” There are no active underground uses of water in Hamlin Valley other than small volume “Stock” and “Other” uses that would not have been included within the model simulations. Please see standard resource response Gen-10 for additional information on this topic.
35028-88	Applicant Committed Environmental Protection Measures, Regional Water-Related Effects: Of the Applicant Committed Measures for the Proposed Action and Alternative A, there are few meaningful measures that apply to Utah resources and that address effects from groundwater withdrawal due to pumping in Spring Valley or due to pumping in Snake Valley on Utah resources. The SNWA Adaptive Management Plan focuses primarily on stipulated agreements for valleys in Nevada, of which the Spring Valley Stipulation only minimally addresses resource monitoring and mitigation in Hamlin and Snake Valleys, Utah. There are a number of other basins in Utah that lie within the Spring Valley Stipulation Area of Interest, but where no monitoring is proposed. For effects due to pumping in Snake Valley, there is no stipulated agreement. Snake Valley pumping may cause flow reduction in a number of basins in Utah including Snake Valley, Hamlin Valley, Pine Valley, Wah Wah Valley or Fish Springs Flat. We recommend that SNWA expand its Applicant Committed Measures to address potentially affected resources in Utah beyond the few that will be monitored as part of the Spring Valley Stipulation.	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2.
35028-89	Between the ADEIS and this DEIS, the following language was removed: "The cumulative impact analysis also was discussed in relation to any regulatory, biological, socioeconomic, or physical thresholds," and these thresholds were uniformly not applied to the resources under consideration in the DEIS. Thresholds such as those above, are strongly recommended in guidance documents such as the CEQ handbook "Considering Cumulative Effects Under the National Environmental Policy Act" (1997) and an EPA Advisory Memorandum titled "Consideration of Cumulative Impacts in EPA Review of NEPA Documents" (1999). Thresholds are critical in presenting meaningful impact analyses to the public who has little knowledge about current status and trends of natural resources. Absent the identification of trends in various species and their habitats, there is no context for evaluating the impacts disclosed in the DEIS. We recommend revisiting the cumulative effects analyses and applying appropriate thresholds that put impacts into context for more effective and meaningful decision-making.	The same threshold critieria used for project effects were applied to the cumulative analysis, particularly for effects to water dependent resources.
35028-90	The analysis of climate change effects is not very useful in that there is no substantive conclusions that reflect best professional judgement of the additive effect of climate change to project specific effects, or cumulative level project effects. It is highly likely that for some wildlife species for example, climate change will increase the vulnerability of a species to other stressors (or vice versa, that groundwater withdrawal for municipal or other needs could render species and ecosystems less resilient to impacts from climate change). Therefore, it is reasonable to suggest that the intensity of impacts and the extent of impact to sensitive wildlife species will multiply beyond that identified in the document at the project specific level and the cumulative effects level. The BLM could also reasonably disclose that effects articulated in the project specific and cumulative effects analyses for certain resources are under-represented.	Please see standard resource responses Air-15, Air-16 and Air-17.

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35028-91	The literature sources referenced in the Wildlife section are useful, but BLM could provide much more context to the reader by summarizing whether the changes already documented are positive or negative for various wildlife guilds. That context would also establish a more meaningful interpretation of project specific and cumulative effects analyses.	The literature cited is summarized to the extent practicable in order to provide the overarching issues and trends. Even within wildlife guilds changes may be positive or negative.
35028-92	It appears that much of the descriptive language and rationale for naming a spring regional, intermediate, or local has been eliminated from the document since the last ADEIS. The reader cannot, therefore, determine whether a spring of interest (i.e. Gandy Warm Spring or Foote Reservoir Spring) is a regional spring. This is important for extrapolating whether a model-predicted reduction in flow at Foote Reservoir Spring is indicative of potential flow reductions at nearby springs, such as Gandy Warm Spring. The potential risk to a species such as least chub, which has a limited distribution, multiplies if all of the springs it occupies in the vicinity of Foote Reservoir Spring are likely to experience reductions in flow over time. The reader is unable to make these kind of comments if the local versus regional nature of all springs within the Region of Study is not consistently presented. It is also critical to articulate how BLM determined if a spring is regional versus local, regardless of where it falls relative to the 10-foot drawdown contour.	Flow, water quality, isotopic and temperature data necessary to classify spring as local, intermediate or regional is not available for the vast majority of springs identified within the region of study. Collecting the necessary information for all springs in this large region would be cost prohibitive and would likely cause considerable delays in completion of the project. Site specific classification of springs based on the likely source is subject to interpretation and potential controversy. For these reasons, the EIS used the methodology described in Section 3.3.8 of the EIS under the heading 'Identification of Springs and Streams Susceptible to Drawdown Impacts" to determine the relative risk to springs identified within the defined drawdown area at the representative points in time.
35028-93	Table 3.3.1-2 of the DEIS lists Fish Springs Flat as having only “North Springs” with discharge of 200 gpm or greater. First, “North Springs” is not a term that is consistently used in other areas of the DEIS (or by the USFWS) that identify named springs on Fish Springs NWR/Fish Springs Flat. This term should be clarified or changed. Second, all measured springs located within the Fish Springs NWR exceed 200 gpm flow so all springs should be listed in the table. These measured springs include North Spring and the South Springs Complex. All measured springs in the South Springs Complex individually exceed 200 gpm flow, including; House Spring, Thomas Spring, Middle Spring, Lost Spring, South Spring, and Percy Spring. Deadman Spring and Crater Spring have not been measured and Walter Spring is currently not being measured, although some or all three of these springs exceed 200 gpm flow. All of these springs exceeding 200 gpm should be listed.	The location for "North Springs" is clearly designated on the USGS topographic maps for the Fish Springs Area. As shown on the USGS maps, North Springs is the northern most spring discharge zone in the Fish Springs area that discharges along a northwest trending zone situated at the foot of the Fish Springs Range. It is located approximately 1 mile northwest of Deadman Springs in the southeast 1/4 section of Section 3, Township 11 south, Range 14 West. North springs is also shown on Figure 3 in the USFWS Comprehensive Conservation Plan, Fish Spring National Wildlife Refuge (USFWS 2004). Table 3.3.1-2 Springs with Average Discharges of 200 gpm or Greater in the Region of Study, as the title of the table indicates, only list spring located within the "Region of Study "are listed in the table. The region of study was extended to include a small portion of the Fish Spring Flat HA (HA 258) that includes a few of the westernmost springs located within the Fish Spring Complex. Specifically, the region of study includes the following springs, North Springs (3,140 gpm), Deadman Spring (52.5 gpm) and Walter Spring (150 gpm). These springs, average flow rates, and data source was provided in Appendix F3.3.1, Table F3.3.1-1A in the EIS. Deadman Spring and Walter Spring are not listed on Table 3.3.1-2 because their average flow was less than 200 gpm. House springs, Thomas Springs, Middle Spring, Lost Spring, Coyote Spring, South Spring and Percy Spring are located outside the water resources region of study.
35028-94	It should be clarified that the stated USFWS estimate of 28.69 cfs is total measured average annual flow and does not represent total actual spring flow. Not all spring discharge has been measured through annual monitoring by refuge staff at any point during the history of the refuge. For 2010 annual monitoring, the total measured average annual flow was 30.46 cfs. This measured flow did not include spring discharge from Deadman Spring, Walter Spring, Crater Spring, or unnamed lesser seeps. At only a few selected times has there been an effort completed by hydrologists to measure total spring discharge from all springs. Total spring discharge was measured at 43.88 cfs in 1961 and 39.79 cfs in 1968 (the latter measurement appears to have possibly left out a spring/s). There was another effort completed in 1991 (34.5 cfs) that clearly did not include all springs. Resolution of varying discharge values may be done partially by reviewing and including the 2009 value posited by the Utah Division of Water Rights and included in the Draft Utah/Nevada Snake Valley Agreement. A value of 20,000 acre-feet per year is asserted as passing through Snake Valley and discharging at the refuge (http://www.waterrights.utah.gov/snakeValleyAgreement/snakeValley.asp).In addition to this 20,000 acre-feet per year, the Utah Geological Survey and the U.S. Geological Survey have asserted in various publications more ground-water is received from the Deep and Fish Springs Ranges as well as the Sevier Desert. Thus, total production from Fish Springs exceeds the 21,000 acre-feet per year reported in the 2004 USFWS Comprehensive Conservation Plan.	The USFWS Comprehensive Conservation Plan, Fish Spring National Wildlife Refuge (USFWS 2004, p. 16) states that "While the Services' water right is roughly 44 cfs, the current annual flow from the springs is about 28.69 cfs. " There are no statements in the USFWS 2004 report that indicate that the estimate of 28.69 "does not include total spring flow " as stated in the comment. The information provided on the referenced web site included in the comment was reviewed; however, no additional flow measurement data for Fish Springs appears to be provided in these documents. The comment states: "For 2010 annual monitoring, the total measured average annual flow was 30.46 cfs. This measured flow did not include spring discharge from Deadman Spring, Walter Spring, Crater Spring, or unnamed lesser seeps." However, a monitoring report providing this data source and describing the specific methodology used to monitor flow was not provided with the comment and therefore, was included in the EIS summary. Regardless, the summary included in the EIS was intended to provide an overview of the "estimated" magnitude of spring discharge that occurs at Fish Springs. The data summarized in the EIS from published reports included estimates flows ranging from 28.69 cfs (USFWS 2004) to 33.5 cfs (Bloke and Sumison 1978). The 30.46 cfs flow provided in the comment is within the range of flows (29.69 cfs to 33.5 cfs) provided in the EIS from the published documents.
35028-95	If BLM is not going to use the model to predict areas where there may be<10-foot of drawdown, then there needs to be an alternative method for identification, disclosure, and analysis. The deficiency of the model to evaluate these areas does not preclude the requirement to analyze these areas and disclose	See response WR-1 regarding the use of the model simulated 10-foot drawdown for the programmatic analysis of potential effects to water dependant resources.
35028-96	There is an implication here that BLM has identified which springs arise from the regional groundwater flow system. If this is the case, BLM needs to disclose which springs meet this criteria and include rationale for that determination. If the DEIS contains such a disclosure, it was not clear where to find this information.	The EIS does not provide site-specific determinations to indicate if individual springs are controlled by regional, intermediate or local flow systems. Flow, water quality, isotopic and temperature data necessary to classify spring as local, intermediate or regional is not available for the vast majority of springs identified within the region of study. Collecting the necessary information for all springs in this large region would be cost prohibitive and would likely cause considerable delays in completion of the project. Site specific classification of springs based on the likely source is subject to interpretation and potential controversy. For these reasons, the EIS used the methodology described in Section 3.3.8 of the EIS under the heading 'Identification of Springs and Streams Susceptible to Drawdown Impacts" to determine the relative risk to springs identified within the defined drawdown area at the representative points in time.

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35028-97	As described in Table 3.3.2-3, Valley Margin Areas support water sources that are local and intermediate and, therefore, are moderately susceptible to pumping from the regional flow system. The table does not provide for a situation where pumping occurs from valley margin areas. What are the local impacts as a result of this situation? It appears relevant because under section 3.3.2.9 Proposed Action, the first paragraph discloses that groundwater development areas will be located in portions of valley floor and valley margin areas within each basin. Therefore, it appears that some of the springs in valley margin areas may be at high risk of impact from the GWD Project pumping.	Specifics regarding the location or design of the production wells is not available for the programmatic level impact assessment of groundwater pumping. Based on the plan of development, regardless of the location of the well head (i.e. at the surface) it is assumed that all groundwater development wells would be design to produce groundwater from the regionally interconnected carbonate and alluvial aquifer system and not be designed to extract water from local or perched aquifer systems not connected to the regional groundwater flow system. The EIS analysis also assumes that regardless of the well design, there is a moderate risk of impacts to perennial water sources that occur in valley margins (except where available water level data indicates that these features are likely perched or hydraulically isolated from the regional groundwater flow system as explained in Section 3.3.2-8.
35028-98	Because BLM has limited its effects analysis (outside of the 10' drawdown contour) to modeled springs that show >5% reduction in flow, the BLM appears to conclude that a reduction in flow<5% equates to no impact. We disagree with this logic as it does not result in full disclosure of potential project impacts. For example, the document fails to account for reductions in flow in habitat critical for least chub, a candidate species for listing under the ESA. Where the groundwater model predicts ><5% reduction in flow in Foote Reservoir Springs, the document concludes no impact to sensitive species that depend on that system (i.e., northern leopard frog and least chub). To the contrary, USFWS found that any further reduction in water levels beyond that which exist today will be detrimental to the least chub (FWS, 2010). Yet, this impact is not	See response WR-1 regarding the use of the model simulated flow reduction to evaluate risk to spring flows used in the programmatic analysis.
35028-99	Where the document presents impacts to water levels from groundwater pumping, it consistently makes an inaccurate statement that "Drawdown does not occur at this time period in Snake Valley because pumping is not projected to begin in Snake Valley until the final stage of the development". This sentence makes an errant and dangerous conclusion that pumping in Spring Valley will not cause drawdown in Snake Valley (at any point in the future). A more accurate statement would be: "Drawdown does not occur at this time period in Snake Valley because pumping effects from Spring Valley have not yet propagated to Snake Valley according to the groundwater model." We recommend that BLM correct its statement where it may be errant, and consider how an inaccurate conclusion may have influenced the analysis of project effects to all resources. This comment is relevant to pumping effects analyses for the proposed action, Alternative A, D and E.	The text was modified to delete the explanation as to why drawdown is not projected to occur in Snake Valley at this timeframe.
35028-100	Utah Surface Water Resources: This section (and others in Chapter 3.3) describes the effect of pumping under the Proposed Action to water resources in Pine Valley. Specifically, drawdown under the Proposed Action at FBO +75 and FBO+200 could propagate into Pine Valley. The model predicts some number<17 feet for drawdown at FBO + 75 years and some number ><51 feet at FBO + 200 years. Because depths to groundwater are deep in Pine Valley and because many investigated springs are intermittent, the DEIS concludes no impact to water resources in Pine Valley. Groundwater depths and surface water status in other valleys such as Wah Wah or Tule are not presented. Water resource conditions in adjacent basins within the Great Salt Lake Desert Flow System may be vulnerable to drawdown propagating through and beyond Pine Valley. We recommend that the BLM provide an analysis of Tule and Wah Wah Valleys similar to the analysis it provided for Pine	Unlike Pine Valley, the drawdown area as defined and presented in the EIS does not propagate to the boundary of Wah Wah and Tule Valleys within the Full build out plus 200 year timeframe considered in the impact assessment. Therefore, the type of evaluation provided for Pine Valley was not necessary for Wah and Wah and Tule Valleys.
35028-101	Utah Surface Water Resources: This section fails to describe impacts of pumping under the proposed action (and other Alternatives) to water resources in Hamlin Valley, Utah. There are a number of terrestrial and aquatic species that rely on surface water resources in the Utah portion of Hamlin Valley that will experience drawdown. This comment applies to Alternatives A - D in addition to the proposed action.	Available baseline information on spring and stream water resources in Hamlin Valley is illustrated on Figure 3.3.1-3 of the EIS. Information on inventoried springs identified in all hydrographic basins (including Hamlin Valley) is provided in Appendix Table F3.3.1-1A in Appendix F3.3.1 of the EIS. Additional information on water resources in Hamlin Valley was provided in the baseline water resources reports that were incorporated by reference in Section 3.3. Potential risk to inventoried springs, other (non-inventoried) springs and perennial stream reaches for all hydrographic basins within the region of study (including Hamlin Valley) is provided in maps and tables provided in Appendix F3.3.7 to Appendix 3.3.11 in the EIS.
35028-102	GW-WR-3:Monitoring and Modeling, Effectiveness: The effectiveness of the Stipulated Agreement monitoring plans, and BLM's annual review of monitoring and modeling results, in providing "early warning" of undesirable impacts is unknown at this point in time. Time lags in biological response to hydrologic changes could be problematic and need to be taken into account when planning and implementing minimization and mitigation measures. Once an ecological change of concern is documented, the cause for this change is determined, and mitigation (such as redistribution or cessation of pumping) is implemented, it may take many years before the system responds to the mitigation efforts (in fact, the adverse impact could get worse before there is any leveling out or rebounding of the system). Ultimately, there could be extensive spatial and temporal loss of water dependent resources, and the DEIS should be clear in disclosing this and addressing this through monitoring and mitigation requirements. Additionally, residual impacts should be disclosed and described as quantitatively as possible (though we understand that there is a lot of uncertainty in this regard). The analysis should be carried through from water resources to all other resources affected by drawdown. This comment applies to Alternatives A-E in addition to the proposed action.	Please see Standard Resource Responses MM-1, MM-2, and MM-3. Text has been updated in Chapter 3.20.

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35028-103	GW-WR-4: Snake Valley 3M Plan: The 3M Snake Valley Plan should be a Term and Condition of ROW authorization. Otherwise, there is no way to ensure adequate consideration of all resource agency needs and no way to ensure enforcement. This comment applies to the Spring Valley and DDC Stipulated Agreement 3M plans as well. This comment applies to Alternatives A-E in addition to the proposed action.	See Standard Resource Responses MM-1 and MM-2.
35028-104	If water is pumped from increasingly deeper depths to maintain the water supply at Shoshone Ponds, it seems possible that there could be changes in water quality and temperature at this location. The DEIS does not address how this could affect the Pahrump poofish and relict dace. We request that BLM include this discussion in the FEIS and require SNWA to maintain the water quality at this location appropriate for protection of relict dace and Pahrump poolfish (include this as an additional mitigation measure).	Please see Gen-1 which discusses programmatic analysis and subsequent NEPA. The detail you request likely would be more appropriately addressed in subsequent NEPA.
35028-105	Utah Surface Water Resources: This section describes impacts of pumping under Alternative A to water resources in Pine Valley. Specifically, pumping at FBO+200 could propagate drawdown into Pine Valley. The model predicts some number<31 feet at FBO + 200 years. Because depths to groundwater are deep in Pine Valley and because many investigated springs are intermittent, the DEIS concludes no impact to water resources in Pine Valley. Water resource conditions in adjacent basins within the Great Salt Lake Desert Flow System may be vulnerable to drawdown propagating through and beyond Pine Valley, yet these resources are not considered. This section should also describe the potential impact of pumping to water resources in Wah Wah Valley, eastern Snake Valley, and Tule Valley. This comment applies to Alternatives A-E in addition to the proposed	See response WR-6 regarding the model boundary and evaluation of impacts to basins located east of Snake Valley.
35028-106	Utah Surface Water Resources: This section fails to describe impacts of pumping under Alternative A to water resources in Hamlin Valley, Utah. Hamlin Valley in Utah supports greater sage-grouse brooding habitat and a number of leks. During early brood rearing, the species depends upon wetter areas that support grasses and forbs. During late brood rearing, the species depends upon mesic vegetation that supports succulent vegetation and insect abundance and diversity. In Hamlin Valley, this type of vegetation is dependent on a number of water sources including springs, seeps and artificial sources such as artesian wells. Recommend that BLM analyze water resources in Hamlin Valley closely and disclose findings, including pumping effects, in EIS. See comments under Vegetation and Terrestrial wildlife resources for additional information. This comment applies to Alternatives A-E in addition to the proposed action.	Available baseline information on spring and stream water resources in Hamlin Valley is illustrated on Figure 3.3.1-3 of the EIS. Information on inventoried springs identified in all hydrographic basins (including Hamlin Valley) is provided in Appendix Table F3.3.1-1A in Appendix F3.3.1 of the EIS. Additional information on water resources in Hamlin Valley was provided in the baseline water resources reports that were incorporated by reference in Section 3.3. Potential risk to inventoried springs, other (non-inventoried) springs and perennial stream reaches for all hydrographic basins within the region of study (including Hamlin Valley) is provided in maps and tables provided in Appendix F3.3.7 to Appendix 3.3.11 in the EIS. Please also refer to the response to your comment #85 for information regarding sage grouse analysis.
35028-107	Monitoring and Mitigation Recommendations: This paragraph references GW-WR-3 for monitoring/mitigation measures to address groundwater drawdown impacts under Alternative A. Under Alternative A, the model and resulting analysis predict impacts to water resources in Snake and Hamlin Valleys, Utah although the document does not differentiate Spring Valley pumping effects from Snake Valley pumping effects. GW-WR-3 cites the Spring Valley stipulation as a source for monitoring and mitigation measures for resources affected under Alternative A. The Spring Valley Stipulation and associated hydrological and biological monitoring plans do little to ensure monitoring and mitigation within Hamlin and Snake Valleys in Utah. Based on Figure 3.3.2-9 (Spring and Well Monitoring Sites, Spring Valley Stip), there are no hydrological monitoring devices in Snake or Hamlin Valleys, Utah. The only biological resources monitored under the Spring Valley Stipulation in Utah are restricted to Snake Valley and are limited to springs, wet meadow, and greasewood communities in the very southwestern corner of the valley. Given the size and complexity of the BMP under this Stip, monitoring of Utah resources is significantly under-represented. There is a need to provide monitoring and mitigation measures for Snake and Hamlin Valleys (Utah) drawdown effects that arise from Spring Valley pumping. This comment applies to Alternatives A-E in addition to the proposed action.	Thank you for your comment Please see Standard Resource Response MM-1.
35028-108	Monitoring and Mitigation Recommendations: This paragraph references GW-WR-4 for monitoring/mitigation measures to address groundwater drawdown impacts under Alternative A. Under Alternative A, the model and resulting analysis predict impacts to water resources in Snake and Hamlin Valleys, Utah. GW-WR-4 cites the draft outline for a Snake Valley 3M plan as a source for monitoring and mitigation measures for resources affected under Alternative A. The effectiveness of the 3M Plan is questionable unless it is a Term and Condition of the ROW authorization, and unless the resource agencies have an opportunity to discuss the draft outline in Appendix B with BLM and SNWA. Recommend creating a final "outline" of the 3M Plan (Appendix B) with input from all relevant parties before finalization of the EIS and ROD. This comment applies to Alternatives A-E in addition to the proposed action.	Thank you for your comment. Please see Standard Resource Response MM-1.
35028-109	There is little meaning in presenting a comparison of alternatives where the No Action assumes the "continuation of existing activities" but the project alternatives are presented as isolated actions. The impacts represented under the project alternatives are inaccurate unless all other existing activity stops, which is not realistic. The project alternatives cannot realistically be compared to the No Action alternative unless the "continuation of existing activities" is incorporated into the projected effects for each project alternative. It is disingenuous to ask the public to compare the alternatives based on unrealistic scenarios.	The basis for the numbers provided in Table 3.3.2-22 are described in Section 3.2 of the EIS. The values for No Action are provided as a frame of reference for comparison and represent effects over the entire region of study as described in the EIS.

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35028-110	It appears that Hamlin Valley (except for ROW and GWD Areas) and Deep Creek Valley were omitted from the Region of Study vegetation analysis without disclosure of a reason. The public and natural resource agencies need to understand what vegetation types exist across these valleys in order to meaningfully comment on the analysis of impacts due to groundwater pumping within the Natural Resources Region of Study. Under a number of the alternatives, Hamlin Valley in particular will experience drawdown that extends into Iron County, Utah where there is crucial brooding habitat, four active greater sage-grouse leks and 2 historical leks. During early brood rearing, the species depends upon wetter areas that support grasses and forbs. During late brood rearing, the species depends upon mesic vegetation that supports succulent vegetation and insect abundance and diversity. We recommend that BLM disclose whether sage-grouse brood rearing habitats in Hamlin Valley will be affected by potential drawdown, and the rationale for its decision. Some potential sources of information that BLM may want to consult include the spring and seep mapping efforts conducted by the state of Utah and BLM for Hamlin Valley as part of the Utah Partners for Conservation & Development Watershed Restoration Initiative. In addition, BLM Cedar City District has published a draft Hamlin Valley EA #DOI-BLM-UT-C010-2010-0022-EA to analyze the effects of improving access to existing Hamlin Valley water sources for greater sage-grouse. This document should provide background information on sources of water and vegetation types.	A full explanation of the Natural Resources Study Area, including reasons for its extension beyond the boundaries of the Water Resources Study Area, may be found in Section 3.0 of the EIS. The boundaries of the Water Resources Study Area is further discussed in response GW-6. UPCDWRI was contacted and suggested topo maps would be the best source for water resources data. These data are included in the FEIS analysis. #DOI-BLM-UT-C010-2010-0022-EA was reviewed and the water resources shown in figures in the EA are included in the FEIS. If there is additional data that the agency is aware of, please provide the data directly to the BLM. The EIS includes a new mitigation measure GW-WL-8, Greater sage-grouse monitoring in Hamlin valley in order to further address this potential issue. Please also refer to the response to your comment #85 for information regarding sage grouse analysis.
35028-111	We recommend obtaining native, local seed from the appropriate NRCS Plant Materials Center instead of using a commercial vendor. The selection of appropriate seed material for rehabilitation or restoration should ideally come from an environment that closely matches the target environment to be seeded (Lesica and Allendorf, 1999; Hufford and Mazer, 2003; Rice and Emery, 2003; McKay et al., 2005). However, decisions about which species to use for restoration are often limited by non-ecological factors such as seed availability and cost (Richards et al., 1998; Pyke and McArthur, 2002; Thompson et al., 2006). Species used in Great Basin restoration projects are native cultivars or introduced grass species like crested wheatgrass (Agropyron cristatum (L.) Gaertn). Native cultivars are limited in number, represent a fraction of the natural genetic diversity of a species, and have narrowly defined, uniform traits due to their selective breeding history (Burton and Burton, 2002). One option managers could try is collecting seeds from species in desirable communities within the watershed and using them for restoration in the degraded communities. This comment applies to Alternatives A-E in addition to the Proposed Action.	See Standard Resource Responses MM-1 and MM-2.
35028-112	The Service does not support planting of monocultures of crested wheatgrass as means to restore sage-grouse habitat. Studies have demonstrated that the establishment of native species into crested wheatgrass stands is difficult (Cox and Anderson 2004; Fansler and Mangold 2010). Attempts to reintroduce native species into crested wheatgrass stands suggest crested wheatgrass plants and propagules need to be destroyed or damaged through mechanical and/or chemical treatments, deliberate introduction of native species is required, and native species used need to be accessed for their performance (Bakker et al. 1997; Cox & Anderson 2004; Fansler and Mangold 2010). Overall, subsequent treatments of crested wheatgrass monocultures may be more costly than initially using a diverse mixture of native seeds for habitat restoration, especially if habitat diversity for wildlife species is the goal. This comment applies to Alternatives A-E in addition to the Proposed Action.	The BLM also does not support the planting of monocultures of crested wheatgrass. The Ely Resource Management Plan (RMP) Best Management Practices (BMPs) for Vegetation Resources requires that when seeding is necessary an appropriate seed mixture and seeding techniques will be approved by the BLM, and that reclamation should be conducted with native seeds that are representative of the indigenous species present in the adjacent habitat. Although there may be cases where a nonnative species may be used for a temporary cover crop to out-compete weeds, the BLM still approves a seed mixture rather than a single species. For this project, the BLM will identify site-specific goals and objectives that are consistent with the Ely RMP BMPs and that will be based on reference sites within the specific ecoregion where the disturbance is occurring. SNWA will submit a Restoration Plan to the BLM that identifies their approach to meeting these goals and objectives. The Applicant Committed Measure referred to in this comment states that SNWA's Restoration Plan will identify a seed mix, application rate, and application method for approval by the BLM. Although specific use of crested wheatgrass was not mentioned in this Applicant Committed Measure, BLM will provide your comment to SNWA and suggest that information and references offered within the comment are considered during development of their Restoration Plan. See also Standard Resource Responses MM-1 and MM-2.
35028-113	The Restoration Plan must include details regarding restoration methods, monitoring methods, and success criteria. We recommend Monitoring Post-Fire Vegetation Rehabilitation Projects: A Common Approach for Non-Forested Ecosystems (Wirth and Pyke 2007) as a reference for monitoring program design and sampling approaches. This comment applies to Alternatives A-E in addition to the Proposed Action.	A comprehensive Restoration Plan (Plan) will be developed after the final project design is completed and submitted to the BLM. The BLM will identify site-specific goals and objectives that will be based on reference sites within the specific ecoregion where the disturbance is occurring. In following the BLM's COM Plan, the SNWA will submit a Plan identifying their approach to restoration that will meet BLM's goals, as well as an approach to monitoring the success of their restoration. Restoration success would be reported to the BLM, and is considered complete when the goals and objectives are met. SNWA will be provided your comment for consideration during development of their Plan, and BLM will suggest that SNWA refer to Wirth and Pyke 2007 in addition to other references, guidance, and policy.
35028-114	For the few Sclerocactus blainei individuals that cannot be avoided and must be salvaged, we recommend that BLM contact folks with experience transplanting other rare Sclerocactus species and/or researchers such as Eric Rechel and others who are studying and comparing different transplantation techniques for Sclerocactus species in Colorado with the goal of maximizing transplantation success. Transplantation effectiveness monitoring should be incorporated for cacti, including S. blainei. Another potential option is to bring the salvaged S. Blainei individuals into captive propagation (e.g., at the Springs Preserve in Las Vegas). This comment applies to Alternatives A-E in addition to the Proposed Action.	Thank you for your comment. The BLM will consider contacting biologists and/or botanists with experience with tranplantation techniques. The BLM and SNWA will also continue working with the Service on identifying methods that may maximize success. BLM has added text to the EIS relative to effectiveness monitoring for transplanted Sclerocactus blainei individuals.
35028-115	We recommend reviewing the University of Arizona Cooperative Extension publication titled How to Transplant a Cactus, supplied to BLM with the Service's comments on the draft BA. This comment applies to Alternatives A-E in addition to the Proposed Action.	Thank you for your comment. During preparation of the final Plan of Development, SNWA will be provided comments specific to their applicant committed measures. The BLM will suggest changes that can be made to strengthen the measures based on these comments.

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35028-116	It appears that this section assumes no drawdown effects to areas outside of ET zones. For Hamlin Valley, over 95% of the valley looks to be outside of a mapped ET zone (Figure 3.5-6). The rationale for excluding the majority of Hamlin Valley from an analysis of pumping effects to vegetation must be presented, especially because much of Hamlin Valley falls within the 10-foot drawdown contour under the various alternatives.	Thank you for your comment. Hamlin Valley has been properly mapped in Figure 3.5-6, and much of it falls under the 10' drawdown contour. Phreatophytic vegetation has also been mapped according to the methodology outlined in the EIS, and is depicted on this figure.
35028-117	To provide an opportunity for meaningful comment, It is critical to discuss cumulative effects in the context of existing conditions and biological thresholds. For example, what extent of each basin is already infested by cheatgrass (existing conditions)? At what point does cheatgrass becomes impossible to manage or reverse i.e. 50% coverage in a given area? (threshold). Based on vegetation succession patterns, BLM could determine how much more area may be infested by cheatgrass as a result of project implementation. It could further disclose how many marginal cheatgrass communities will tip over to a majority of cheatgrass and therefore be unmanageable/irreversible. This comment applies to Alternatives A-E in addition to the proposed action.	Thank you for your comment. Applicant-committed measures and BLM Best Management Practices will be implemented to minimize the spread of invasive weed species. Site-specific NEPA analysis will be performed on subsequent tiers. Please see Standard Resource Response Gen-2 for a discussion of programmatic analysis and subsequent tiering.
35028-118	Greater sage-grouse leks in Hamlin, Pine, and Deep Creek Valleys, Utah are not represented on Figure 3.6-7 or considered in the document. For more information on the Hamlin Valley population, please contact Rhett Boswell at UDWR: 435-865-6112 or Nikki Frey at Southern Utah University (435)586-1924. The document should be revised to present baseline information for these valleys and the potential for these water sources (and species such as sage-grouse that rely on these water sources and mesic vegetation) to be affected by groundwater drawdown. In Hamlin Valley, a number of water sources exist that support vegetation used by greater sage-grouse during nesting and brood-rearing. These water sources include springs, seeps and artesian wells. Information about the water sources can be found at the Utah Partners for Conservation and Development Watershed Resource Initiative website as well as in the Hamlin Valley EA #DOI-BLM-UT-C010-2010-0022-EA.	The leks in Utah are shown on FEIS Figure 3.6-7 and included in the FEIS analysis. UPCDWRI was contacted and suggested topo maps would be the best source for water resources data. These data are included in the FEIS analysis. #DOI-BLM-UT-C010-2010-0022-EA was reviewed and the water resources shown in figures in the EA are included in the FEIS. Please also see responses to your comments #85 and #110.
35028-119	Please note that while we have not yet requested an Avian Protection Plan, discussions with SNWA on migratory bird and eagle protection measures have been delayed and, thus, our determination of what specifically is needed to protect these species from anticipated project impacts has been delayed. We anticipate that these discussions will occur in the very near future, so that recommendations can be incorporated into the FEIS and the Record of Decision. Regardless, we recommend providing a more complete assessment of impacts to eagles in the DEIS (e.g., "There would be an X probability of collisions and electrocutions to wintering and breeding eagles because..."). Also, please explain how adaptive management would address changing conditions in regard to eagle presence or use of the project area. This comment applies to Alternatives A-E in addition to the Proposed Action.	Since the release of the DEIS, the BLM has initiated formal Section 7 consultation to address potential impacts to listed species. A Biological Assessment was provided to the FWS in May 2012 and this assessment includes analysis of the GWP Project relative to listed species. The BLM has had several meetings with the FWS regarding Section 7 consultation and will continue to meet as needed until the Biological Opinion is finalized. With regard to migratory bird and bald and golden eagle issues, SNWA has met with the FWS to discuss conformance with the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). The SNWA has committed to completing a bird conservation strategy to address these issues.
35028-120	At some point in this section, we recommend referencing the following three documents and the management direction they provide regarding Migratory Bird Habitat: Executive Order 13186, IM 2008-050 MBTA, and the BLM MOU with USFWS regarding migratory birds. There are measures included in each that specify management direction relative to 1) the analysis of direct and indirect impacts to nesting habitat, fragmentation of habitat, and reduction in habitat patch size (IM 2008-050 MBTA); 2) identification of the amount of affected habitat and relative abundance of the habitats over the landscape (IM 2008-050 MBTA); and 3) bird habitat protection and conservation (BLM/FWS MOU).	The EIS has been revised. IM 2008-050 states that "The MOU would replace the interim policy guidate for addressing migratory bird conservation." As such, the reference to the USFWS and BLM MOU remains in the document and a reference to the Executive Order has been added. The brief general statement regarding management direction also has been revised.
35028-121	There is little meaningful analysis or presentation of groundwater pumping impacts to migratory bird habitat. The analysis appears to be limited to the percentage of total ET areas subject to drawdown and what types of birds exist in the habitats affected by drawdown. Recommend the following: 1) Identify the acreage of each habitat type that will be lost under each groundwater pumping scenario; 2) Summarize that information in the main text of the document; 3) Evaluate habitat loss in light of the relative abundance of those habitat types over the landscape, as well as the trends for those habitat types. The Utah Wildlife Action Plan identifies abundance, levels of threat, and trends for 10 key habitat types in Utah. Where these habitat types overlap with the Region of Study, they should be referenced to establish a context for evaluating impacts (i.e. existing conditions). This analysis is supported by management direction in the following documents: Executive Order 13186, IM 2008-050 MBTA, and the BLM MOU with USFWS regarding Migratory Birds. This comment applies to Alternatives A-E in addition to the proposed action.	The FEIS outlines methodology for potential drawdown impacts on terrestrial wildlife from pumping in Section 3.6.2.8 - Groundwater Pumping. Given the programmatic analysis of this portion of the document, the key habitats (those with the potential to be impacted by groundwater drawdown) are identified as: springs, perennial streams, and two phreatophytic (or ET) vegetation types - wetland/meadow and basin shrubland. Impacts are quantified by the three GW model timeframes in tables in the vegetation section (springs by number, perennial streams by mile, and ET vegetation types by acreage). See Tables 3.5-14 through 3.5-20; for a summary comparison, see Table 3.5-21. In Appendix F, Tables F3.6-9 though F3.6-16, these impacts are then put into context by providing the impact as a percent of total habitat within a given basin. For example, in Table F3.6-14 (Alt E), in the full-build out +200 year timeframe in Spring Valley: 7% of perennial streams, 13% of springs and 22% of wetland/ meadow ET types are in areas where impacts could occur. This level of analysis has been completed for all alternatives.
35028-122	Even if eggs have not been laid, if evidence of nesting (i.e., mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (refer to Service 2007) should be delineated around the entire area. This area should be avoided to prevent destruction or disturbance to nests until they are no longer active. This comment applies to Alternatives A-E in addition to the Proposed Action.	Thank you for your comment. SNWA updated their applicant committed measures in March 2012, after the publication of the draft EIS and before the publication of the Final EIS. The updated measure includes language that addresses this comment.

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35028-123	The FWS has conservation responsibilities and management authority for migratory birds. Therefore, please coordinate closely with the Service on any actions that may affect the burrowing owl or any other migratory bird. ACM A.5.44, referred to here, states that SNWA would coordinate with the BLM and NDOW on relocation of burrowing owls. Relocation of burrowing owls would require a special purpose permit issued through our Regional Migratory Bird Office in Sacramento. This comment applies to Alternatives A-E in addition to the Proposed Action.	Since the release of the DEIS, the BLM has initiated formal Section 7 consultation to address potential impacts to listed species. A Biological Assessment was provided to the FWS in May 2012 and this assessment includes analysis of the GWP Project relative to listed species. The BLM has had several meetings with the FWS regarding Section 7 consultation and will continue to meet as needed until the Biological Opinion is finalized. With regard to migratory bird and bald and golden eagle issues, SNWA has met with the FWS to discuss conformance with the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). The SNWA has committed to completing a bird conservation strategy to address these issues.
35028-124	There is no comparison of alternatives for terrestrial wildlife under Groundwater Pumping. The document should present an analysis that demonstrates how the various groundwater pumping scenarios compare relative to impacts to terrestrial species. Without this analysis, the reader cannot provide meaningful comment to the DEIS. This comment applies to Alternatives A-E in addition to the proposed action.	A comparison has been added to the FEIS.
35028-125	GW-WL-8: "The Snake Valley 3M Plan will include management and mitigation measures that could be used to address impacts identified during monitoring relevant to terrestrial wildlife species". This sentence implies that monitoring of terrestrial wildlife (e.g., greater sage-grouse or migratory birds) responses to groundwater pumping will be implemented. However, it does not appear that there is a monitoring provision for these species, therefore it would be impossible to say at what point and to what extent terrestrial wildlife has been impacted. We recommend adding a provision to Appendix B, Snake Valley 3M Plan, that articulates a monitoring, management and mitigation requirement for terrestrial species that may not be considered "groundwater dependent" but yet rely on vegetation (at some point of the year) that is subject to groundwater drawdown effects. Based on language in the Spring and DDC Valley Stipulation Agreements and associated documents, DOI will likely be pressed by SNWA to prove that it is pumping that has decreased habitat for a terrestrial (or aquatic) species. The potential for this situation to occur, and the potential difficulties of showing cause and effect, should be addressed in the DEIS. This comment applies to Alternatives A-E in addition to the proposed action.	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2.
35028-126	The monitoring and mitigation recommendations provided on this page do not address the loss of migratory bird habitat due to groundwater pumping. The Snake Valley 3M Plan does not appear to include provisions to monitor or mitigate for the effects of migratory bird habitat loss. One cannot assume that monitoring of northern leopard frog habitat, for example, translates into monitoring for migratory bird habitat. The same rationale applies to mitigation. It is unsupported to imply that mitigation for lost frog habitat will translate into effective mitigation for lost migratory bird habitat. This section of the document should identify specific measures that will be implemented to ensure protection and conservation of migratory bird habitat. The identification of such measures is supported by management direction in the following documents: Executive Order 13186, IM 2008-050 MBTA, and the BLM MOU with USFWS regarding Migratory Birds. This comment applies to Alternatives A-E in addition to the proposed action.	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2.
35028-127	For cumulative impacts related to pipeline disturbance, we ask BLM quantify the existing disturbance (acres of previous fires, existing roads, site-type ROWs, linear ROWs) of areas that would intersect the area of pipeline construction. Then, analyze impact to terrestrial species based on the combined acreage. This comment applies to Alternatives A-E in addition to the Proposed Action.	As presented in Section 2.9.1 of the EIS, past and present actions include existing disturbance and acreages are presented in Table 2.9-1. Project-specific acreages for ROWs and future GWD facilities also are presented in the table. A qualitative discussion of the cumulative impacts to terrestrial wildilfe by alternative is included starting with Section 3.6.3.4.
35028-128	The table should be updated to reflect the following: Least chub is a Tier I species in the Utah Comprehensive Wildlife Conservation Strategy, Utah Wildlife Action Plan (UDWR, 2005). Northern leopard frog is a Tier III species. Columbia spotted frog is a Tier I species.	The tier levels and reference were added to Table 3.7-3.
35028-129	Least chub: The DEIS should disclose that in its 12-month finding for least chub, the USFWS found that current levels of water pumping represent a significant threat to least chub, contributing to the need to the list the species under the ESA. It additionally finds that any further reduction in water levels beyond that which exist today will be detrimental to the species.	The additional finding information was added to the least chub discussion.
35028-130	Least chub: The DEIS should be clear that Bishop Springs Complex includes Foote Reservoir Springs, a spring existing outside the 10-foot contour but where reduced flows are predicted.	Foote Reservoir Springs was added to the list of least chub populations.
35028-131	Amphibians, Northern leopard frog: The DEIS should be clear that Bishop Springs Complex includes Foote Reservoir Springs, a spring existing outside the 10-foot contour but where reduced flows are predicted.	Foote Reservoir Springs was added to the list of northern leopard frog occurrence locations.
35028-132	Amphibians, Northern leopard frog: According to the 2007 Bio-West report prepared for SNWA (Ecological Evaluation of Selected Aquatic Ecosystems in the Biological Resources Study Area), surveyors found northern leopard frog in the following springs not represented in this paragraph: Leland Harris and Twin Springs, Snake Valley, Utah. Bio-West cited Utah Division of Wildlife Resources to support these findings.	Leland Harris and Twin Springs were added to the occurrence locations for northern leopard frog.

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35028-133	A big issue with rights-of-way would be the potential threat of spreading or encouraging the spread of invasive aquatic species. Spread could occur both unintentionally through mud on vehicle tires (for example) or by the purposeful spread of sport fish, released pets, bait bucket releases, etc. Improved access by the public to aquatic ecosystems will increased this threat significantly. Habitat alterations will also greatly increase this threat. Invasive species are one of the major threats to native aquatic biodiversity, in addition to habitat loss and destruction.	Discussions with NDOW indicated that the spread of invasive aquatic species is not an issue for this project. Only two perennial streams are crossed by the pipeline and transmission line ROWs and they do not contain invasive aquatic species.
35028-134	Suggest adding an invasive species monitoring, avoidance, and eradication measure throughout the project footprint and activities. Public spread of exotics is a significant concern to native biodiversity. An effective strategy to respond aggressively and decisively to any incursions of exotic species is necessary to avoid allowing invasive fauna to become locally entrenched in aquatic ecosystems. There are many invasive species, but a short list includes mosquitofish, shortfin mollies, tilapia, carp, bass, sunfish, red-rimmed melania snails, bullfrogs, and crayfish (of any type). To date, Spring Valley aquatic systems appear to be free of many of the aquatic invasive vertebrates and invertebrates that plague other systems in the Region of Study, such as red-rimmed melania snails and bullfrogs. Keeping invasive species out of these systems should be a high priority. This comment applies to Alternatives A-E in addition to the Proposed Action.	Discussion with NDOW indicated that invasive aquatic species are not an issue related to the ROWs for this project. Only two perennial streams are crossed by the pipeline and transmission line ROWs, with no invasive aquatic species occurring in these streams. ROW disturbance does not extend into the Region of Study.
35028-135	This paragraph relies on information gleaned from Appendix F3.7, Table F3.7-13A to summarize potential effects to special status fish species. The referenced table inaccurately presents "no data" as it pertains to Percent Change in Flow at Bishop Springs Area. Foote Reservoir Springs is part of the Bishop Springs Area. The model predicts a 2% reduction in flow at Foote Springs under the proposed action at FBO + 200 years and a 1% reduction in flow at Foote Springs under Alternative A, FBO + 200 years. This percent change in flow should be reflected in Table F3.7-13A and further analyzed for impacts to least chub in Section 3.7 as the species is sensitive to even minor changes in groundwater levels. This comment applies to Alternatives A-E in addition to the proposed action.	The estimated flow reductions for Foote Reservoir Springs were added to Table F3.7-13A. No revisions were made in the special status fish discussion because the flow reductions of 1 to 2 percent are considered minor and within the range of flow measurement error.
35028-136	Given the acknowledged limitations of the CCRP model, it is inaccurate and unsupported to say that least chub will not be affected by groundwater pumping and subsequent groundwater drawdown. To the contrary, the sensitivity of the species to even minor (<1') changes in groundwater levels (as documented in the 2010 12-month finding for the species) in addition to the regional connectivity of springs where least chub exists indicates a potential for effect. SNWA is a party to the least chub conservation agreement which calls for maintaining the hydrological features of the springs that support least chub. These factors all present a compelling case to acknowledge and develop measures to avoid ANY effect to the springs that support least chub. This comment applies to Alternatives A-E in addition to the proposed	The model analysis and 10-foot drawdown areas indicate that pumping effects on least chub are unlikely. Flow estimates indicate that Foote Reservoir Springs could be reduced by 1 to 2 percent. This flow change is considered minor and within the flow measurement range of error.
35028-137	This paragraph relies on information gleaned from Appendix F3.7, Table F3.7-13B to summarize potential effects to amphibians. The referenced table neglects to include two northern leopard frog occupied habitats: Gandy Salt Marsh and Bishop Spring/Foote Reservoir Springs. These habitat locales should be included in the table. Percent flow change data should also be presented for Bishop Spring/Foote Reservoir Springs. The model predicts a 2% reduction in flow at Foote Springs under the proposed action at FBO + 200 years and a 1% reduction in flow at Foote Springs under Alternative A, FBO + 200 years. This percent change in flow should be reflected in Table F3.7-13B and further analyzed for impacts to northern leopard frog in Section 3.7.	Bishop Spring/Foote Reservoir Springs was added to the Snake Valley habitats for northern leopard frog in Table F3.7-13B. No revisions were made to the northern leopard frog discussion, since estimated flow reductions of 1 to 2 percent are considered minor and within the margin of error for flow measurement.
35028-138	Compliance with Management Objectives: A fifth species (least chub) should be included in this section. SNWA is a signatory to the least chub conservation agreement. The model predicts a 2% reduction in flow at Foote Springs (habitat for least chub) under the proposed action at FBO + 200 years and a 1% reduction in flow at Foote Springs under Alternative A, FBO + 200 years. The Proposed action and Alternative A pumping scenarios conflict with management objectives for this species. Given the acknowledged limitations of the CCRP model, it is inaccurate and unsupported to say that least chub will not be affected by groundwater pumping and subsequent groundwater drawdown. To the contrary, the sensitivity of the species to even minor (<1') changes in groundwater levels (as documented in the 2010 12-month finding for the species) in addition to the regional connectivity of springs where least chub exists indicates potential for effect. SNWA is a party to the least chub conservation agreement which calls for maintaining the hydrological features of the springs that support least chub. These factors all present a compelling case to acknowledge and develop measures to avoid ANY effect to the springs that support least chub. This comment applies to Alternatives A-E in addition to the proposed	A least chub section was added to the discussion of compliance with management objectives.

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ID	Comment	Response
35028-139	Very little meaningful information is provided to describe cumulative effects to aquatic species as a result of groundwater pumping. Context and thresholds are critical in presenting meaningful impact analyses to the public who has little knowledge about current status and trends of natural resources. Absent the identification of trends in various species and their habitats, there is no context for evaluating the impacts disclosed in the DEIS. For the longitudinal gland pyrg, for example, model predictions for the Proposed Action and Alternative A indicate complete loss of habitat for the species. The cumulative effects section should reiterate that if project specific pumping will eliminate the full range of habitat, then cumulative effects will most certainly do the same. A threshold for this species would be easy to establish: 100% elimination of the species' natural habitat is unacceptable. This section should determine whether this threshold will be met under a cumulative effects scenario. This comment applies to Alternatives A-E in addition to the proposed action.	Threshold levels such as 100 percent loss of habitat can only be used for those 30 springs with adequate data to allow predictions of flow changes by the model. This information can be added to the cumulative discussion but this type of threshold level can not be used for springs with no model-predicted flow changes or streams.
35028-140	In the case of Gandy Salt Marsh ACEC in Millard County, Snake Valley, Utah, the BLM did not comprehensively consider the impact of groundwater pumping. It could use two criteria to determine effects: 1) overlap of groundwater drawdown contours and 2) presence of a specifically modeled water source where a reduction in flow is predicted. While the 10-foot groundwater drawdown contour does not overlap with Gandy ACEC, there is reason to believe that the individual springs contributing to the salt marsh may be impacted. Modeling of Foote Reservoir Spring, part of the Bishop Springs Complex approximately 4 miles away from the Gandy ACEC, revealed a 1-3% reduction in flow depending on the alternative, timeframe and project specific vs. cumulative scenario. Given that Foote Reservoir Spring and Gandy Salt Marsh are regional level springs that exist within the valley floor, it is reasonable to assume a similar level of impact between the two water bodies. The BLM should disclose potential effects to Gandy Salt Marsh in the document or its rationale in determining no effect. Should an effect be disclosed, BLM should identify potential conflicts with ACEC management direction, how it will avoid an adverse effect, and the effectiveness of such measures. This comment applies to Alternatives A-E in addition to the proposed action.	Section 3.14 uses the information from the groundwater model to identify impacts of groundwater pumping to special designations with wetland meadow and phreatophytic vegetation areas as well as springs and streams. A more thorough analysis of the groundwater model results is pesented in Section 3.3. Also see the response to WR-1.
35028-141	This paragraph should describe to the reader that the measures are only in summary form; i.e., Section 3.20 should not be used now or in the future without referencing more detailed information about the mitigation measures. Either in this paragraph or under the individual measures, BLM should provide a reference for the reader where he can find more detailed information.	The measures described in this section are the same wording as presented in the individual resource sections. The word "Summary" was replaced by "Measures" in the section title.
35028-142	GW-WR-3, as it is presented here, does not specify what kind of monitoring will be reflected in the annual monitoring reports. In case this section of the EIS is ever used as a stand-alone document, the language that describes GW-WR-3 should be more explicit OR include a reference where the reader can find more detailed information.	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2.
35028-143	To provide a good summary to the reader, it would be useful to add the following information to GW-WR-4: 1) The 3M Plan, as it exists in the DEIS, is only an outline of what should be included in the Plan; 2) The purpose of the 3M Plan for Snake Valley should include "where" the three purposes apply. For example, "where" will it protect water dependent resources on public lands? In Snake Valley only? In a not yet described "area of interest"? 3) When will SNWA, in conjunction with DOI agencies and the States, develop a long term 3M Plan for Snake Valley? 4) Whether the Snake Valley 3M Plan is specific to Snake Valley pumping OR whether it also covers pumping from other valleys (e.g., Spring Valley); and 5) Who will approve the plan, enforce it and how?	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2.
35028-144	The first bullet under GW-WR-6 should be revised to remove "general" in the description of water quality. In some cases where wildlife species are concerned, a specific water quality may be critical to provide habitat.	Text was modified as requested.
35028-145	GW-VEG-3: See comments for GW-WR-4.	See Standard Resource Responses MM-1 and MM-2.
35028-146	GW-WL-8: "The Snake Valley 3M Plan will include management and mitigation measures that could be used to address impacts identified during monitoring relevant to terrestrial wildlife species" implies that monitoring for terrestrial wildlife responses to groundwater pumping will be implemented. It does not appear that there is a plan for such monitoring; therefore, it would be impossible to say at what point and to what extent terrestrial wildlife has been impacted. The resource agencies will also likely be asked by SNWA to prove that it is pumping that has decreased habitat for a terrestrial species. The potential for this situation to occur should be analyzed and addressed somewhere in the NEPA document.	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2.
35028-147	GW-AB-3: The summary information here should articulate "whom" will be responsible for identifying specific mitigation measures and "when" they will be identified.	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2.

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ID	Comment	Response
35028-148	The document is only an outline, developed by BLM and SNWA, of what should be included in a final 3M Snake Valley Plan. It is currently divided between "required" components and those that fall under the term "guidance". We are concerned that Resource Agency input will not be considered at this critical point in time. We recommend that prior to publication of the Final EIS and ROD, BLM work with all parties (including DOI Agencies, NDOW, UDWR) to develop an outline of required components of a 3M Plan that is inclusive of all party needs. The Agencies need an opportunity outside of the NEPA process to interact with the BLM and SNWA about the content of the draft Plan.	Additional detail will be provided in the 3M Snake Valley Plan as monitoring and mitigation planning is further defined as part of the comprehensive project-wide monitoring and mitigation plan (COM Plan). Please see standard resource responses MM-1 and MM-2.
35028-149	Recommend renaming the document: "Draft Outline - Monitoring, Mitigation and Management Plan for Snake Valley, Utah-Nevada."	Thank you for your comment. Please see Standard Resource Response MM-1 and Appendix B.
35028-150	We fully support the detail with which the main text of the 3M Plan is written and believe it is critical to include as required components of the 3M Plan (as opposed to "guidance").	Thank you for your comment. Please see Standard Resource Response MM-1.
35028-151	The USFWS fully supports a multi-party effort for development of the 3M Plan and is committed to meaningful involvement in the process. We also fully support adoption of the 3M Plan as a Term and Condition of issuance of the ROW and believe that is the best way to ensure that monitoring and mitigation occurs in Snake Valley and the rest of the Great Salt Lake Desert Flow System (including Hamlin Valley).	A multiparty effort will be used in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan). See Standard Resource Response MM-1.
35028-152	It is critical that a 3M Snake Valley Plan be developed through a multi-party process that includes the relevant resource agencies with state and federal trust responsibilities (i.e. Utah DWR, NDOW, US Fish and Wildlife Service Reno and Utah Offices, NPS). We recommend including the USFWS Refuge System if they wish to be involved.	A multiparty effort will be used in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan). See Standard Resource Responses MM-1 and MM-2.
35028-153	Recommend identifying the geographic area (Great Salt Lake Desert Flow System, including Fish Springs Flat, Hamlin Valley, Tule Valley, Pine Valley, and Wah Wah Valley)to which the 3M Plan will apply within the purpose of the document. It is critical information that should be immediately available to the reader.	A sentence was added that said the Plan will apply to Snake, Hamlin, Tule, Pine, Wah Wah, and Fish Springs Flat valleys.
35028-154	Recommend that the third purpose of the 3M Plan be revised as follows: "Provides a process for identifying and mitigating impacts."	Thank you for your comment. Please see Standard Resource Response MM-1.
35028-155	Recommend that BLM change the last sentence in this paragraph to the following: "The 3M Plan will include, but is not limited to:"	Thank you for your comment. Please see Standard Resource Response MM-1.
35028-156	The final sentence of this paragraph reads "Final approval of the Snake Valley 3M Plan (or any interim Plans) rests with the BLM". This sentence is important and should be moved to the beginning of the document.	Thank you for your comment. Please see Standard Resource Response MM-1.
35028-157	The first sentence of Paragraph 6 should be revised to read: "SNWA would be responsible for the development and implementation of management actions associated with the 3M Plan including all monitoring activities prior to (i.e. baseline) and during the life of the project.	Thank you for your comment. Please see Standard Resource Response MM-1.
35028-158	SNWA should provide results and analysis of monitoring not only to BLM, but to the technical group and management committee.	Thank you for your comment. Please see Standard Resource Response MM-1.
35028-159	It is critical that the 3M Snake Valley Plan outline a geographic area to which it will apply. We fully support the text on page B-3, under "Monitoring Area" that articulates its application to the Great Salt Lake Desert Flows system, and hydrographic basins adjacent to Snake Valley including Fish Springs Flat, Tule Valley, Pine Valley, and Wah Wah Valley. We recommend, however, that the Plan articulate the geographic area to which Management and Mitigation applies. The geographic areas for Management and Mitigation should be the same as those for Monitoring.	Thank you for your comment. Please see Standard Resource Response MM-1.
35028-160	We are concerned with the language used to describe Appendix B Supplement 1. We recommend that the BLM call the supplement something other than "Guidance," as many of the provisions will be critical to a meaningful Snake Valley 3M Plan. If the 3M Plan is written to truly reflect measures in the Stipulations, then the majority of the "guidance" should be required elements.	Thank you for your comment. Please see Standard Resource Response MM-1.
35028-161	Members of the Technical Working Group should be more specifically defined according to roles.	The members and roles will be defined in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan). See Standard Resource Responses MM-1, MM-2, and MM-3.
35028-162	Recommend adding a paragraph that emphasizes: 1) the link between hydrology and biology and 2) the importance of coordination/collaboration in the development of hydrological and biological plans. For example, in order to correlate changes in habitat or species populations to changes in hydrology, it is critical to monitor hydrology at times and locations compatible with collection of biological data. Therefore, hydrologists and biologists must consult with one another when developing hydrology and biology monitoring networks to ensure individual data collection is informative to each group.	Thank you for your comment. Please see Standard Resource Response MM-1.

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ID	Comment	Response
35028-163	It may not be prudent for the 3M Plan to rely on the existing groundwater monitoring networks established by the USGS and by the UGS as it is not clear how long into the future they will be funded and operated. Specifically, an intention by UGS to maintain and operate its network for at least the next 50 years does nothing to assure the reader that the network will be maintained and operated post-pumping in Snake Valley. This section of Appendix B Supplement 1 could reference the uncertainty of these networks and articulate a way to address it so that the reader is assured the networks will be available and functioning once pumping starts in Spring and Snake Valleys, and into the future.	Thank you for your comment. Please see Standard Resource Response MM-1. The BLM has assembled all comments on the stipulated agreements and have provided them to the Executive Committee which oversees the implementation of the agreements. Additionally, text was added to the Management of Monitoring Data to identify the technical working group as the entity that will ensure that a database network is functioning prior to and during pumping.
35028-164	Under Biological Provisions, the document should be clear that monitoring, management and mitigation can apply to terrestrial species such as migratory birds or greater sage-grouse, for example, whose brooding habitat may be affected by groundwater pumping. Recommend adding a provision to Appendix B, Snake Valley 3M Plan, that articulates that monitoring, management and mitigation can apply to aquatic and terrestrial species that rely on groundwater-dependent vegetation (at some point of the year). It is critical to tie changes in groundwater dependent vegetation and other habitat components to changes in the vigor and viability of species of concern, which should be identified through the technical working group process. The technical working group will be responsible for determining the resources of concern that need to be included in the monitoring, management, and mitigation program, including terrestrial and aquatic species.	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2. Additionally, text was added to the biology provisions that indicate that the technical work group will determine the resources and species to be included in the monitoring, management, and mitigation program. Aquatic and terrestrial species would be included in the provisions as appropriate.
35028-165	The Service would appreciate reviewing sections of the POD, Mitigation Plan, Integrated Weed Management Plan, and Restoration Plan that pertain to Service trust resources, including migratory birds and species to be considered for the section 7 consultation (federally listed species and technical assistance species).	The USFWS will be able to review the POD and the various plans. See Standard Resource Responses MM-1 and MM-2.
35028-166	Is one Compliance Inspector Contractor enough for a project of this size?	A compliance inspector contractor (CIC) is an organization that is selected by BLM and paid for by the applicant. The CIC will ensure that BLM monitoring and mitigation requirements identified through the record of decision and the approved plan of development are implemented. The CIC will hire the number of individuals that are needed to carry out the assignment.
35028-167	It may be necessary and advisable to inspect tortoise exclusion fencing after it is installed on a more frequent basis, to ensure that a tortoise has not been trapped within the fenced area.	Thank you for expressing your concerns regarding the effectiveness of one of the proposed ACMs, which were updated by SNWA in March 2012, after the publication of the Draft EIS and before the publication of the Final EIS. The updated measure includes language that addresses this comment. In addition, as a listed species, the Service will ultimately determine appropriate measures within desert tortoise habitat that will be provided to the BLM through the terms and conditions listed in the Biological Opinion. These terms and conditions will supersede both Applicant Committed Measures and BLM recommended mitigation. Your suggestions have been carefully considered by the BLM.
35028-168	Temporary erosion and sediment controls will need to be inspected following large precipitation events.	The monitoring and mitigation for this project is complex and extensive. The BLM is looking at two separate processes for the development of the monitoring and mitigation plans for this project. Currently there are stipulated agreements which have been developed through the Nevada State Water Engineer that BLM is a member. BLM also manages surface and mineral resources for federal lands it administers under FLPMA and therefore BLM has developed a project-wide COM Plans are to protect federal resources that may be impacted by construction, operation, maintenance and abandonment of the project related facilities, see changes to section 3.20. This section outlines the process that BLM now and in the future will follow for mitigation for this project. Mitigation related to groundwater development will be included in subsequent NEPA and associated valley-specific COM Plans as described in section 3.20.
35028-169	The Service would appreciate reviewing the restoration plan for sage-grouse habitat, or the habitat of any other listed or technical assistance species. We would like the opportunity to provide input on restoration and monitoring methods, as well as success criteria.	The BLM has requested technical assistance from the Service for seven non-listed species: Greater sage-grouse, Northern leopard frog, Longitudinal gland pyrg, Flag pyrg, Butterfield pyrg, Lake Valley pyrg, and Blaine's pincushion. The agreement to seek technical assistance on these species provides an opportunity for the BLM and the Service to work cooperatively in development of mitigation and monitoring for these species. Specifically, the Service is provided an opportunity to offer conservation recommendations to the BLM based on their review of pertinent documents and participation in meetings and conference calls. As such, the Service will be provided an opportunity to participate in the review of any plans addressing mitigation and monitoring for these species.
35028-170	The Restoration Plan must include details regarding restoration methods, monitoring methods, and success criteria. We find it difficult to evaluate the restoration conservation measures without this information, and we cannot assume successful restoration will occur with the information we have been provided in the Applicant Committed Measures. We recommend Monitoring Post-Fire Vegetation Rehabilitation Projects: A Common Approach for Non-Forested Ecosystems (Wirth and Pyke 2007) as a reference for monitoring program design and sampling approaches.	A comprehensive Restoration Plan (Plan) will be developed after the final project design is completed and submitted to the BLM. The BLM will identify site-specific goals and objectives that will be based on reference sites within the specific ecoregion where the disturbance is occurring. The SNWA will submit a Plan identifying their approach to restoration that will meet BLM's goals, as well as an approach to monitoring the success of their restoration. Restoration success would be reported to the BLM, and is considered complete when the goals and objectives are met. SNWA will be provided your comment for consideration during development of their Plan, and BLM will suggest that SNWA refer to Wirth and Pyke 2007 in addition to other references, guidance, and policy.
35028-171	Cacti and yucca are protected under Nevada Revised Statutes (NRS) 527.060 to 527.110 and Nevada Administrative Code chapter 527. Removal or possession requires a permit and tags from the Nevada State Forester Firewarden, Nevada Division of Forestry. Also, we recommend reviewing the attached University of Arizona Cooperative Extension publication titled How to Transplant a Cactus.	Thank you for your comment. During preparation of the final Plan of Development, SNWA will be provided comments specific to their applicant committed measures. The BLM will suggest changes that can be made to strengthen the measures based on these comments.

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ID	Comment	Response
35028-172	We recommend obtaining native, local seed from the appropriate NRCS Plant Materials Center instead of using a commercial vendor. The selection of appropriate seed material for rehabilitation or restoration should ideally come from an environment that closely matches the target environment to be seeded (Lesica and Allendorf, 1999; Hufford and Mazer, 2003; Rice and Emery, 2003; McKay et al., 2005). However, decisions about which species to use for restoration are often limited by non-ecological factors such as seed availability and cost (Richards et al., 1998; Pyke and McArthur, 2002; Thompson et al., 2006). Species used in Great Basin restoration projects are native cultivars or introduced grass species like crested wheatgrass (Agropyron cristatum (L.) Gaertn). Native cultivars are limited in number, represent a fraction of the natural genetic diversity of a species, and have narrowly defined, uniform traits due to their selective breeding history (Burton and Burton, 2002). One option managers could try is collecting seeds from species in desirable communities within the watershed and using them for restoration in the degraded communities.	Please refer to standard resource responses MM-1 and MM-2 for information on this topic.
35028-173	The Service does not support planting of monocultures of crested wheatgrass as means to restore sage-grouse habitat. Studies have demonstrated that the establishment of native species into crested wheatgrass stands is difficult (Cox and Anderson 2004; Fansler and Mangold 2010). Attempts to reintroduce native species into crested wheatgrass stands suggest crested wheatgrass plants and propagules need to be destroyed or damaged through mechanical and/or chemical treatments, deliberate introduction of native species is required, and native species used need to be accessed for their performance (Bakker et al. 1997; Cox & Anderson 2004; Fansler and Mangold 2010). Overall, subsequent treatments of crested wheatgrass monocultures may be more costly than initially using a diverse mixture of native seeds for habitat restoration, especially if habitat diversity for wildlife species is the goal.	The BLM also does not support the planting of monocultures of crested wheatgrass. The Ely Resource Management Plan (RMP) Best Management Practices (BMPs) for Vegetation Resources requires that when seeding is necessary an appropriate seed mixture and seeding techniques will be approved by the BLM, and that reclamation should be conducted with native seeds that are representative of the indigenous species present in the adjacent habitat. Although there may be cases where a nonnative species may be used for a temporary cover crop to out-compete weeds, the BLM still approves a seed mixture rather than a single species. For this project, the BLM will identify site-specific goals and objectives that are consistent with the Ely RMP BMPs and that will be based on reference sites within the specific ecoregion where the disturbance is occurring. SNWA will submit a Restoration Plan to the BLM that identifies their approach to meeting these goals and objectives. The Applicant Committed Measure referred to in this comment states that SNWA's Restoration Plan will identify a seed mix, application rate, and application method for approval by the BLM. Although specific use of crested wheatgrass was not mentioned in this Applicant Committed Measure, BLM will provide your comment to SNWA and suggest that information and references offered within the comment are considered during development of their Restoration Plan. See standard resource responses MM-1 and MM-2.
35028-174	Seven years seems like a short time-frame for assessing restoration success in the Mojave and Great Basin deserts.	The BLM will identify site-specific restoration goals and objectives that will be based on reference sites within the specific ecoregion where the disturbance is occurring. The SNWA will submit a Plan identifying their approach to restoration that will meet BLM's goals, as well as an approach to monitoring the success of their restoration. Restoration success would be reported to the BLM, and SNWA will not be released from their restoration responsibilities until BLM agrees that the goals and objectives have been met. During preparation of the final Plan of Development, SNWA will be provided your comment specific to their applicant committed measure. The BLM will suggest changes that can be made to this measure to emphasize that BLM will determine the time at which restoration is complete.
35028-175	For the few Sclerocactus blainei individuals that cannot be avoided and must be salvaged, we recommend that BLM contact folks with experience transplanting other rare Sclerocactus species and/or researchers such as Eric Rechel and others who are studying and comparing different transplantation techniques for Sclerocactus species in Colorado with the goal of maximizing transplantation success. Transplantation effectiveness monitoring should be incorporated for cacti, including S. blainei. Another potential option is to bring the salvaged S. Blainei individuals into captive propagation (e.g., at the Springs Preserve in Las Vegas).	Thank you for your comment. The BLM will consider contacting biologists and/or botanists with experience with tranplantation techniques. The BLM and SNWA will also continue working with the Service on identifying methods that may maximize success. BLM has added text to the EIS relative to effectiveness monitoring for transplanted Sclerocactus blainei individuals.
35028-176	ACM A.1.14 (p. B-4) states that temporary tortoise-exclusion fencing will be used within desert tortoise habitat, while ACM A.5.19 states that there will be areas within desert tortoise habitat not enclosed by tortoise exclusion fencing. Please clarify. Also, it is not clear what is meant by "timing of the survey will be determined at the project-level consultation." We thought that all desert tortoise impacts were associated with the main pipeline, and that the tortoise would not be impacted by future activities being considered programmatically herein. Is this incorrect?	ACM A.1.14 states that temporary desert tortoise exclusion fencing will be used to enclose active pipeline, staging area, and facility site construction areas. The specific actions identified are long-term construction activities. For short-term actions, such as power pole placement, desert tortoise fencing may or may not be necessary; if not necessary, SNWA proposes to implement ACM A.5.19. The Service is correct that tortoise will be addressed through the section 7 consultation being prepared for the main pipeline rather that at the programmatic level, and the timing of the survey will be identified in the biological opinion for the main pipeline (i.e. what SNWA refers to in their ACM as the project-level consultation). As a listed species, the Service will determine, through the section 7 consultation, when tortoise fencing is or is not required, what additional conservation measures must be implemented if tortoise fencing is not required, and the appropriate timing of surveys. While SNWA can identify measures they propose to implement, the biological opinion issued by the Service will ultimately determine the measures that must be taken and how they will be carried out.
35028-177	Please clarify what is meant by "where appropriate" as it relates to this measure.	The Applicant Committed Measure was taken from the Ely District RMP, which is an overarching, general guidance document developed by the District. As such, measures are written in a way that provides flexibility to the decision-maker for specific projects. The EIS provides mitigation related to this measure that is specific to this project. In addition, as a listed species, the Service will ultimately determine appropriate restrictions within desert tortoise habitat that will be provided to the BLM through the terms and conditions listed in the Biological Opinion. These terms and conditions will supersede both Applicant Committed Measures and BLM recommended mitigation. The BLM's COM Plan will incorporate these elements in the development of the Plan. The COM Plan will identify the triggers necessary for the protection of Natural Resources.

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ID	Comment	Response
35028-178	Blasting may have site specific and unknown effects on desert tortoise. We recommend adding: "If blasting is necessary, SNWA shall notify BLM 48 hours prior to any blasting. Field meetings will be held to review the blasting process and its implementation prior to blasting. Effects of blasting on desert tortoise and their burrows shall be reported to the USFWS."	Thank you for your comment. SNWA updated their applicant committed measures in March 2012, after the publication of the Draft EIS and before the publication of the Final EIS. The updated measure includes language that SNWA will report effects of blasting to both the BLM and the Service. SNWA will provide a blasting plan to the BLM, which will identify protocol for how blasting will be conducted (including notifying the BLM, conducting field meetings, and how SNWA will coordinate with the Compliance Inspector Contractor). This blasting plan must be approved by the BLM prior to issuance of the Notice to Proceed. Language has been added to the EIS explaining this process. In addition, the Service will issue terms and conditions in its Biological Opinion that will address blasting in desert tortoise habitat. The blasting plan must be in conformance with those terms and conditions.
35028-179	The FWS has conservation responsibilities and management authority for migratory birds. Therefore, please coordinate closely with the Service on any actions that may affect the burrowing owl. This measure states that SNWA would coordinate with the BLM and NDOW. Relocation of burrowing owls would require a special purpose permit issued through our FWS Regional Migratory Bird Office in Sacramento.	Since the release of the DEIS, the BLM has initiated formal Section 7 consultation to address potential impacts to listed species. A Biological Assessment was provided to the FWS in May 2012 and this assessment includes analysis of the GWP Project relative to listed species. The BLM has had several meetings with the FWS regarding Section 7 consultation and will continue to meet as needed until the Biological Opinion is finalized. With regard to migratory bird and bald and golden eagle issues, SNWA has met with the FWS to discuss conformance with the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). The SNWA has committed to completing a bird conservation strategy to address these issues.
35028-180	Even if eggs have not been laid, if evidence of nesting (i.e., mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (refer to Service 2007) should be delineated around the entire area. This area should be avoided to prevent destruction or disturbance to nests until they are no longer active.	Thank you for your comment. SNWA updated their applicant committed measures in March 2012, after the publication of the draft EIS and before the publication of the Final EIS. The updated measure includes language that addresses this comment.
35028-181	The pipeline and new roads have been sited to be 0.25 miles or more from active sage-grouse leks. Why was this buffer distance chosen, and why does BLM consider this to be sufficient? Other pipelines have had more stringent conservation measures (e.g., 0.6 mile buffer, where practicable, for the Ruby Pipeline). It would be worth exploring whether there are some leks that are considerably larger and/or of higher relative importance for maintaining populations in the affected valleys, and then applying more stringent conservation measures (e.g., larger buffers) to avoid disruption of sage-grouse activity at these leks.	The 0.25 mile buffer was chosen from BMPs in the Ely District RMP, which was considered to be the best science at that time. The BLM has recently issued IM 2012-043, which provides greater sage-grouse interim management policies and procedures. This IM requires BLM offices to identify preliminary priority habitat and preliminary general habitat in coordination with NDOW, and to use the best available science when defining buffers. The EIS has been updated to use a 4-mile buffer around leks as recommended by the Sage-grouse National Technical Team in its Report on National Greater Sage-Grouse Conservation Measures (December 21, 2011). Where transmission is being considered, the analysis will instead use a 3-mile buffer as recommended in the Nevada Energy and Infrastructure Development Standards to Conserve Greater Sage-Grouse Populations and their Habitats (Nevada Governor's Sage-Grouse Conservation Team, April 2010). These documents are currently considered to be the best available science.
35028-182	It is not clear what is meant by "restrict" permitted activities. We recommend that SNWA avoid construction activities from March 1 through May 15 within 2 miles of an active sage-grouse lek. "Restrict" could mean "reduce" or "limit" as opposed to ceasing an activity. Also, it is not clear what "where appropriate" means as it relates to these measures.	Thank you for your comment. SNWA updated their applicant committed measures in March 2012, after the publication of the draft EIS and before the publication of the Final EIS. Substantive changes have been made to the language. Since the release of the Draft EIS, the BLM has issued IM 2012-043, which provides greater sage-grouse interim management policies and procedures. The IM requires the BLM to work with applicants to minimize habitat loss, fragmentation, and direct and indirect effects to greater sage-grouse and its habitat. Further, the IM requires BLM to work with NDOW to assess the impacts to greater sage-grouse and its habitat, ensure that reasonable alternatives are considered, and to identify technically feasible BMPs and conditions that may be implemented in order to eliminate or minimize impacts. Through the technical assistance process, the USFWS will be involved with this coordination, which will result in development of specific mitigation, minimization, and/or avoidance measures. Please refer to standard resource responses MM-1, MM-2 and MM-2.
35028-183	These activities should also be coordinated with the Service.	Thank you for your comment. SNWA updated their applicant committed measures in March 2012, after the publication of the draft EIS and before the publication of the Final EIS. The updated measure includes language that addresses this comment. Through the technical assistance process, the USFWS will be involved with efforts to minimize impacts to the greater sage-grouse and its habitat.
35028-184	It sounds like SNWA is considering a 1:1 mitigation ratio for sagebrush habitat disturbed by this project. However, a certain percentage of any revegetation effort will not be successful, so SNWA should consider restoring more habitat than was destroyed by the project. The mitigation measure may be partly dependent on quality of the sagebrush habitat that will be destroyed or altered by the project, which has not been discussed (but should be) in the BA.	A comprehensive Restoration Plan (Plan) will be developed after the final project design is completed and submitted to the BLM. The BLM will identify site-specific goals and objectives that will be based on reference sites within the specific ecoregion where the disturbance is occurring. The SNWA will submit a Plan identifying their approach to restoration that will meet BLM's goals, as well as an approach to monitoring the success of their restoration. Restoration success would be reported to the BLM, and is considered complete when the goals and objectives are met.

Comments and Responses - Federal Government

ID	Comment	Response
35028-185	Similar to the comment above (ACM A.5.49), please explain why a 0.25-mile buffer distance from active leks was chosen, as other pipelines have had more stringent conservation measures (e.g., 0.6 mile buffer). Again, it would be worth exploring whether there are some leks that are considerably larger and/or of higher relative importance for maintaining populations in the affected valleys, and then applying more stringent conservation measures (e.g., larger buffers) to avoid disruption of sage-grouse activity at these leks.	The 0.25 mile buffer was chosen from BMPs in the Ely District RMP, which was considered to be the best science at that time. The BLM has recently issued IM 2012-043, which provides greater sage-grouse interim management policies and procedures. This IM requires BLM offices to identify preliminary priority habitat and preliminary general habitat in coordination with NDOW, and to use the best available science when defining buffers. The EIS has been updated to use a 4-mile buffer around leks as recommended by the Sage-grouse National Technical Team in its Report on National Greater Sage-Grouse Conservation Measures (December 21, 2011). Where transmission is being considered, the analysis will instead use a 3-mile buffer as recommended in the Nevada Energy and Infrastructure Development Standards to Conserve Greater Sage-Grouse Populations and their Habitats (Nevada Governor's Sage-Grouse Conservation Team, April 2010). These documents are currently considered to be the best available science.
35028-186	This document was prepared "to address inherent uncertainties in predicting potential effects of SNWA's groundwater withdrawals on groundwater-dependent systems, other water right holders, and other resources." Yet, it appears that the AMP only applies to valleys where pumping will occur. There will likely be groundwater pumping effects in basins where withdrawal is not occurring. These valleys (e.g. Hamlin Valley) should be specifically addressed. In addition, the AMP should specify that it applies to Snake Valley even if pumping does not occur there.	Please refer to standard resource responses MM-1, MM-2 and MM-3 for information relevant to this comment.
35028-187	There is a general lack of information about how SNWA will address the last objective on this page to "Avoid, minimize or mitigate degradation of visibility and air quality due to potential increases in airborne particulates and loss of surface vegetation". The AMP should be revised to incorporate needs for data collection, monitoring, establishment of indicators and thresholds, reporting, and Plan implementation specific to air quality.	Please see standard resource responses MM-1 and MM-2.
35028-188	The 1st, 2nd, 4th and 6th bullet statements (objectives) on this page should be revised to remove "or" and replace it with "and/or". Avoidance and minimization should be pursued prior to, or in conjunction with, mitigation.	These changes would be to the Applicant committed measures that SNWA has agreed and committed to in the plan of development and for the use in the NEPA analysis. These measures cannot be changed by BLM unless the applicant agrees upfront to the changes or the NEPA analysis shows additional monitoring or mitigation measures are needed to protect resources identified. See section 3.20 for additional information on a project-wide COM Plan and mitigation identified from the NEPA analysis.
35028-189	SNWA should clearly state whether its Environmental Goals and Objectives apply to groundwater-dependent ecosystems and biological communities on private land, regardless of a connection to a federal trust resource.	The application of SNWA's goals and objections to private land will be defined in the development of a comprehensive project-wide monitoring and mitigation plan (COM Plan).
35028-190	The AMP references future monitoring plans and the development of environmental indicators for Snake Valley. It is unclear whether these components of the AMP apply only if pumping occurs in Snake Valley. If no pumping occurs in Snake Valley, model predictions still show effects to Snake Valley resources from pumping in Spring Valley. Language in the AMP should be revised to make it clear that monitoring plans for Snake Valley will be developed regardless of pumping in Snake Valley (in order to monitor effects from pumping in other valleys). If the Spring Valley Stipulation monitoring will be expanded to include additional areas in Snake Valley (or adjacent basins), if observations or model-predicted impacts show this is needed, then this mechanism should be identified.	Please refer to standard resource responses MM-1, MM-2 and MM-2 for information on responsive to this comment.
35028-191	The AMP in general is "Stipulation-centric", meaning that resources not covered in the Stipulations are not addressed. For example, Under Plan Implementation, Prior to Groundwater Withdrawal, SNWA states the following: "The baseline data will be collected for the specified minimum time periods and annual reports submitted, as required under future water rights rulings and the Spring Valley and DDC Stipulations". Each section of the AMP should be reviewed and revised to ensure that resources not covered by the Stipulations are addressed. Those resources would include: 1) air quality, and 2) groundwater-dependent ecosystems in valleys not covered by the Stipulations (yet affected by pumping), and with no direct connection to a federal trust resource.	Please refer to standard resource responses MM-1, MM-2 and MM-2 for information on responsive to this comment.
35028-192	This paragraph is confusing in that it appears to create dual roles for BLM and potentially conflicting management decisions. Where resources are covered by the Stipulated Agreements, the process outlined here results in two separate analyses, one conducted by BLM alone and one conducted by the Stipulation Executive Committees. This possible scenario should be considered and addressed.	Please refer to standard resource responses MM-1, MM-2 and MM-2 for information on responsive to this comment.
35028-193	We ask that habitat enhancement projects, to mitigate for effects to Yuma clapper rail, southwestern willow flycatcher, and yellow-billed cuckoo from groundwater withdrawal, be conducted as close to the area of impact as possible. We also ask that SNWA conduct habitat enhancement projects in occupied and suitable habitat for these species (e.g., offsite enhancement projects for Yuma clapper rail should be constructed in the Virgin and Muddy Rivers; yellow-billed cuckoo projects should be conducted near Warm Springs or Pahranagat Valley) . We request more specificity of the types of habitat enhancment projects SNWA would undertake. Finally, we request that SNWA coordinate closely with BLM and FWS when selecting these habitat enhancment projects.	Thank you for your comment. During preparation of the final Plan of Development, SNWA will be provided comments specific to their applicant committed measures. The BLM will suggest changes that can be made to strengthen the measures based on these comments.

Comments and Responses - Federal Government

ID	Comment	Response
35028-194	Figure does not demonstrate that there are a number of active and historical leks in Hamlin, Deep Creek and Pine Valleys, Utah. These leks and grouse brooding habitat were subsequently not analyzed for pumping effects under the various alternatives. The habitat and leks indicate there is vegetation other than "upland" species. The source of water for this vegetation should be identified and disclosed in the document and an analysis of drawdown should be conducted specific to grouse brooding habitat.	The leks in Utah are shown on FEIS Figure 3.6-7 and included in the FEIS analysis.
35028-195	Recovery plans with management objectives also exist for the Muddy River aquatic ecosystem (Moapa dace), Big Spring spinedace, and Pahranagat Valley aquatic ecosystem (Pahranagat roundtail chub).	These three species and their recovery plans are not included in this table because the model analysis indicates no groundwater pumping effects to these species.
35028-196	This table is not clear as there is no indication what "N" means (which populates most of the table cells) and footnotes are often not defined (e.g. footnote "2" in table 13A). Explanation (if any) requiring reference back to Volumes 1A or 1B creates a lot of work and is difficult to follow. Tables (appendices) should stand on their own.	Definitions for N and Y are provided as Effect Definitions at the bottom of all tables. Footnotes were checked to make sure definitions are provided for each table.
35028-197	Although "total stream miles" and other absolute measures may be valuable for some species and habitats, it is misleading (minimizes disclosure) for many springs and spring endemics because the entire ecosystem and/or species may exist only within a very small area. It would be clearer to provide a relative measure like "percent of entire spring ecosystem" or "percent of range of species X" when disclosing impacts of water withdrawal in these areas. This comment applies to many other parts of the analyses as well. As an example, for the Muddy River entry on page F3.7-97, the entry may be correct in that approximately 6.2 miles of the ecosystem is impacted, but it would be helpful to make clear (and misleading to omit) that this 6.2 miles represents 100% of the Moapa dace's entire global distribution.	Where appropriate, impacts will be revised to include an indication of relative portion of stream habitat affected.
35028-198	It is difficult to understand what the values in the tables mean. Please make this clearer, perhaps provide an explanation at the beginning.	A cover sheet was added for these tables to explain the information presented in the tables.
35028-199	Identification of the Environmentally Preferred Alternative. The Service recommends that a combination of Comment Alternatives E and C be identified as the environmentally preferred alternative. Specifically, the Service recommends identification of the following alternative as the scenario that would minimize impacts to water dependent biotic resources while fulfilling the aim of providing a supplemental source of water for the project proponent: no project pumping in Snake Valley (for reasons outlined in our March 23, 2011 and October 11, 2011 letters); pumping by the project proponent in Spring Valley not limited to the LCRDA corridor, i.e., not concentrated in southern Spring Valley (also for reasons outlined in our March 23, 2011 letter); and pumping of groundwater as a whole limited to periods when municipal demand cannot be meet by the project proponent with available Lake Mead water, except for minimum flows required to maintain the pipeline and other project facilities in a ready condition.	Pursuant to the National Environmental Policy Act, BLM will identify the "environmentally preferable alternative" in the Record of Decision. This document, the FEIS, will contain an "agency preferred alternative". We will consider your comments carefully when crafting our "agency preferred alternative".
35028-200	As described in our October 11, 2011 cover letter, we are concerned that the cumulative effects analysis is limited in a number of ways, including geographically due to truncation of the Water Resources Region of Study at the Snake Valley boundary. Therefore, it appears that past and present consumptive groundwater use is not considered for many basins within the Great Salt Lake Desert flow system (Table 2.9-3), including but not limited to Pine, Wah Wah, Hamlin, and Tule valleys. Given that pumping in these basins could cumulatively affect groundwater levels and flow within the Great Salt Lake Desert Flow System, it seems reasonable to include and consider them. If no pumping currently exists in these basins, that conclusion (and how it was reached) should be presented in the document. Second, Table 2.9-4, Estimated Reasonably Foreseeable Future Groundwater Developments Included in the Cumulative Analysis, does not appear to address and consider Hamlin, Pine, Wah Wah, and Tule valleys. If there are no groundwater development projects that meets BLM's criteria for inclusion in these basins, that conclusion and supporting rationale should be presented in the document.	See response WR-6 regarding the model boundary and evaluation of impacts to basins located east of Snake Valley.
35028-201	To provide more comprehensive vegetation community characterizations, the BLM could draw information from the relevant Districts in Utah (Fillmore and Cedar City).	Please refer to standard resource responseMM-1 for information on this topic.
35028-202	It should be noted that in Service comments to the draft Natural Resources Baseline report (dated January 25, 2008), the Service voiced particular concern that Utah resources were not adequately addressed. We recommended a thorough review of all available information before finalization of the report. As described in the following comments, inadequate consideration of Utah resources remains a significant concern.	Where avaialble, information describing Utah natural resources were included in the EIS. Additional information was added since the preparation of the Natural Resources Baseline Report.
35028-203	The description of the Region of Study for vegetation is unclear. It appears that the Region of Study for vegetation resources is the same as the Natural Resources Region of Study, yet this is not specifically stated. It is also confusing because the analysis of pumping effects to groundwater-dependent vegetation seems to be constrained to an area that is considerably smaller than the Natural Resources Region of Study.	Thank you for expressing your concerns related to the Draft EIS. The Regions of Study are first presented and discussed in Section 3.0 of the EIS. The Natural Resources Region of Study (which includes vegetation) is further defined in the last paragraph of the Overview section of Affected Environment within the Vegetation Resources (Section 3.5.1.1). An additional sentence has been added to Section 3.5.1.4 (Region of Study) to further clarify that the study area for Vegetation Resouces is the Natural Resources Region of Study.

Comments and Responses - Federal Government

ID	Comment	Response
35028-204	Without a hydrological model to support effects analyses in Pine, Wah Wah, and Tule valleys, it is unclear how one can analyze project effects to vegetation in these valleys. Yet, these valleys are included in the Natural Resources Region of Study. This inconsistency should be better explained and addressed in this paragraph, specifically regarding the consequences of two different regions of study (Water Resources vs. Natural Resources). There are a number of reasons to believe there may be project effects to groundwater resources in these valleys: 1) The 10' contours for the Proposed Action and cumulative effects at 200 years after FBO are truncated at the boundaries between Hamlin Valley and Pine Valley, and Snake Valley and Pine Valley. As a result, the reader is left to guess how many more valleys could be affected by drawdown; 2) The effects analysis is incomplete in that drawdown is only considered where it is 10' or greater (or where a spring was specifically modeled); 3) From Table 3.3.2-6 of the Water Resources section, a 10% reduction in flow from Snake Valley to Pine, Wah Wah and Tule valleys is predicted at FBO + 200 years; and, 4) No springs or ET areas in Pine, Wah Wah or Tule valleys were included in the model, so one cannot conclude there will be no effects to these basins from pumping without additional explanation.	The differences between the Water Resources and Natural Resources Regions of study are detailed and explained in Section 3.0 of the EIS. The natural resources region of study included four valleys (Pine, Wah Wah, Tule, and Deep Creek) that were not part of the water resources model area because these four basins specifically contained game or special status species, as explaied in Section 3.5.1.1. A full discussion of the groundwater flow model area and its boundaries may be found in Standard Resource Response WR-6.
35028-205	This Figure should depict the entire Natural Resources Region of Study. As it stands, the Figure does not depict vegetation land cover for Deep Creek Valley, northern Snake Valley or Fish Springs Flat.	Figure 3.5.1 does present vegetation land cover data for the entire Natural Resources Region of Study.
35028-206	It is unclear why no springs of biological interest are mapped and inventoried in Deep Creek, Tule, Pine, and 3 and 3.5-4 Wah Wah Valleys because all of these valleys lie within the Natural Resources Region of Study. The document should address this discrepancy and provide information that explains how springs in these valleys were considered. There are a number of reasons to believe there may be project effects to groundwater resources in these valleys: 1) The 10' contours for the Proposed Action and cumulative effects at 200 years after FBO are truncated at the boundaries between Hamlin Valley and Pine Valley, and Snake Valley and Pine Valley. As a result, the reader is left to guess how many more valleys could be affected by drawdown; 2) The effects analysis is incomplete in that drawdown is only considered where it is 10' or greater (or where a spring was specifically modeled); 3) From Table 3.3.2-6 of the Water Resources section, a 10% reduction in flow from Snake Valley to Pine, Wah Wah and Tule valleys is predicted at FBO + 200 years; and, 4) No springs or ET areas in Pine, Wah Wah or Tule valleys were included in the model, so one cannot conclude there will be no effects to these basins from pumping without additional explanation.	The Water Resources Region of Study did not include these valleys; thus springs are not included in this table. The differences between the Water Resources and Natural Resources Regions of Study are detailed and explained in Section 3.0 of the EIS. The Natural Resources Region of Study included four valleys (Pine, Wah Wah, Tule, and Deep Creek) that were not part of the water resources model area because these four basins specifically contained game or special status species, as explained in Section 3.5.1.1. A full discussion of the groundwater flow model area and its boundaries may be found in Standard Comment Response WR-6.
35028-207	This table neglects to include vegetation characteristics for spring systems in Hamlin Valley, Pine or Wah Wah Valleys, yet all are within the Natural Resources Region of Study and presumably contain spring systems with vegetation. We recommend that BLM identify spring systems in these valleys and the vegetation they support.	The differences between the Water Resources and Natural Resources Regions of Study are detailed and explained in Section 3.0 of the EIS. The Natural Resources Region of Study included four valleys (Pine, Wah Wah, Tule, and Deep Creek) that were not part of the water resources model area because these four basins specifically contained game or special status species, as explained in Section 3.5.1.1. A full discussion of the groundwater flow model area and its boundaries may be found in Standard Comment Response WR-6.
35028-208	There is an unexplained disconnect between the boundaries of the Natural Resources Region of Study and the valleys actually mapped for phreatophytic vegetation. Because Figure 3.5-3 relies on corresponding ET data from the Water Resources section, a number of valleys were left out of the analysis. These valleys are Pine, Wah Wah, Tule, and Deep Creek. We recommend that BLM map phreatophytic vegetation in these valleys as there is reason to believe groundwater resources will be affected in these areas.	The differences between the Water Resources and Natural Resources Regions of Study are detailed and explained in Section 3.0 of the EIS. The Natural Resources Region of Study included four valleys (Pine, Wah Wah, Tule, and Deep Creek) that were not part of the water resources model area because these four basins specifically contained game or special status species, as explained in Section 3.5.1.1. A full discussion of the groundwater flow model area and its boundaries may be found in Standard Comment Response WR-6.
35028-209	There is an inaccurate and confusing sentence in this paragraph: "The same ET areas are illustrated by individual basin in Section 3.3, Water Resources." This is incorrect as the only basins mapped for ET areas in Section 3.3, Water Resources, are Spring, Snake Valleys, Dry, Delamar and Cave Valleys. Therefore, it is unclear what information was used to establish the presence and extent of phreatophytic vegetation in Hamlin Valley.	Hamlin Valley was included in both the Water Resources and Natural Resources Regions of Study. Please see Section 3.0 for more information and full descriptions of these study areas.The methodology used to establish the presence of phreatophytic vegetation is described in Section 3.5.
35028-210	The information provided in this paragraph may be inaccurate and misleading in 1) its reference of the 2007 BIO WEST reports; and 2) the representation of BIO-WEST's work. While the DEIS reports that "BIO-WEST conducted habitat surveys for this species in spring-fed meadows in several project and adjacent hydrologic basins, " the surveys did not cover a representative portion of those valleys in the Natural Resources Region of Study. SNWA only contracted with BIO-W EST to review 32 springs in Spring and Snake Valleys for Ute ladies'- tresses; only one of those springs occurs in Utah {Clay Springs). No surveys were conducted in Hamlin Valley, Pine Valley, Tule Valley, Wah Wah Valley, or Deep Creek Valley for the species, and only one spring was visited in Snake Valley, Utah.	Thank you for your comment. The statement as written in the FEIS is accurate: BIO-WEST did conduct the surveys "in several project and adjacent hydrologic basins." The methodology and locations of BIO-WEST's surveys are fully disclosed in their reports (2007 a,b) and there is no attempt to obscure these survey methodologies in this FEIS. The results of these surveys are also presented fairly in the FEIS; "populations [of ULT] were not found in these surveys, but suitable habitat was identified."
35028-211	This paragraph does not accurately represent the status of Spiranthes diluvialis across the Natural Resources Region of Study, specifically within Utah valleys. There is very little information that can be drawn from the 2007 BIO-WEST Spiranthes report because, as the author states, it is" .. .impossible to eliminate the possibility of the species for these springs after peak flowering or during a single visit." BIO-WEST visited Clay Springs in Utah to conduct surveys only once. USFWS must assume that if habitat exists and surveys for the plant have not been conducted according to protocol, then there is potential for the species to exist at the site. This paragraph should be revised to reflect this information.	Thank you for your comment. Additional analyses will be performed during subsequent NEPA to address specific areas with specialized plant communities and specific soil conditions.

Comments and Responses - Federal Government

ID	Comment	Response
35028-212	The population of Spiranthes diluvialis referenced in this paragraph for northern Snake Valley, Utah {Callao) is presumed extant.	Your comments on the Draft EIS have been considered.
35028-213	It is unclear if any special status species, other than Spiranthes, were considered for groundwater pumping effects. At a minimum, the BLM-Nevada Sensitive Species List and BLM-Utah 2011 Interim Sensitive Plant Species List should be referenced. We recommend that BLM review those lists for species that may be affected by groundwater drawdown and include them in this section {if not already).	A summary of special status plant species known or potentially present within the groundwater development areas is presented in Table 3.5-4. There were five species observed in the groundwater development areas, and three species with potential habitat. Potential habitat was based on the similarity in associated vegetation, soils, and slopes to areas occupied by known populations.
35028-214	It would benefit the document and subsequent vegetation analysis to provide a reference for the following assumption: an index drawdown contour of 10 feet is a reasonable estimate of the point at which long-term changes in plant community vigor and composition would begin to appear. Of the references provided, BLM should specifically state which support{s) this assumption.	Please see Standard Comment Response WR-1 for a complete description and rationale for the 10-ft drawdown contour.
35028-215	Methodology for Analysis, Groundwater Pumping: We recommend that BLM analyze effects to wetland/meadow and basin shrubland within the Utah basins included in the Natural Resources Region of Study (if BLM believes there will be no effects to phreatophytic vegetation in these areas, document these reasons). We further recommend that BLM include a Methodology for Analysis for groundwater pumping effects to plant communities in basins outside the hydrologic Region of Study, but within the Natural Resources Region of Study.	The differences between the Water Resources and Natural Resources Regions of Study are detailed and explained in Section 3.0 of the EIS. The Natural Resources Region of Study included four valleys (Pine, Wah Wah, Tule, and Deep Creek) that were not part of the water resources model area because these four basins specifically contained game or special status species, as explained in Section 3.5.1.1. A full discussion of the groundwater flow model area and its boundaries may be found in Standard Comment Response WR-6.
35028-216	We recommend further separating the yellow layer in these Figures to distinguish between phreatophytic through 3.5-through 6 through vegetation communities outside of the Project 10' drawdown and those more than 50' above groundwater. It 66 3.5.2.15 3.5-12 is unclear, for example, whether the phreatophytic vegetation in mid- and northern Snake Valley (Utah) and White River Valley (Nevada) is more than 50' above groundwater or outside the 10' drawdown contour.	Thank you for your comment. An explanation of the methodology used to generate these figures is presented in "Methodology for Analysis" in Section 3.5.2.8, Groundwater Development and Pumping. Your suggestion has been carefully considered by the BLM, but has not resulted in changes to the analyses presented in this document.
35028-217	The various chapters of the document are inconsistent in the assessment of groundwater pumping effects to through 3.5-through 6 through springs in mid and northern Snake Valley. In these Figures, the Gandy system, the Bishop Springs complex, the 66 3.5.2.15 3.5-12 Fish Springs complex and Callao springs are all presented as "Impacts likely." Yet, these spring systems and the aquatic flora and fauna they support are not addressed as such in the water resources and aquatic resources sections.	The differences between the Water Resources and Natural Resources Regions of Study are detailed and explained in Section 3.0 of the EIS. A full discussion of the groundwater flow model area and its boundaries may be found in Standard Comment Response WR-6.
35028-218	These figures illustrate three categories of springs (Valley floor- Impacts Likely, Valley Margin - Impacts Possible through 3.5- through 6 through and Other Springs). Springs that fall under the first category, Valley floor- Impacts Likely, include many in mid 66 3.5.2.15 3.5-12 and northern Snake Valley. Some of these springs include the Gandy system, Bishop Springs complex, Callao and those at Fish Springs National Refuge. It stands to reason that if these valley floor and valley margin springs are likely to experience impacts from groundwater pumping, then the phreatophytic vegetation will be affected as well. If not, then the BLM should provide an explanation.	The differences between the Water Resources and Natural Resources Regions of Study are detailed and explained in Section 3.0 of the EIS. A full discussion of the groundwater flow model area and its boundaries may be found in Standard Comment Response WR-6.
35028-219	Absent Spiranthes diluvialis surveys (according to Service protocol) in areas of suitable habitat, the Service through 3.5-through 45, cannot assume that the species does not occur at the site. We are not aware of such surveys in the Utah 66 3.5.2.15 paragraph portion of the Natural Resources Region of Study, other than the one survey conducted in 2007 at Clay Springs. The text in this paragraph should reflect this conclusion and disclose how BLM will address pumping effects to this species.	Thank you for your comment. Additional analyses will be performed during subsequent NEPA to address specific areas with specialized plant communities and specific soil conditions.
35028-220	The study area for groundwater pumping is defined here and is referenced as "the boundary for the groundwater model simulations (Figure 3.0-2)." First, it is not clear why the cumulative effects study area (which we assume is also the region of study) is smaller than the region of study referenced in the beginning of the Vegetation Resources chapter. It should be the same, if not larger. Second, there may be a typo here as Figure 3.0-2 depicts a process, not a map.	Thank you for your comment. The Project Study Areas, including the Water Resources Region of Study and the Natural Resources Region of Study are fully discussed in Section 3.0. The reference in the text has been changed to properly reference Figure 3.0-3.
35028-221	One purpose of a cumulative effects analysis is to put project effects into context for the public. We recommend that BLM provide additional information to: 1) identify existing conditions and trends in the persistence and sustainability of vegetation resources; and 2) identify thresholds for the assessment of resource degradation. For example, how much succession has already occurred across varying scales (Great Basin region, Nevada, Utah, by valley)? How much wetland acreage has already been lost? How much loss is acceptable on public lands? Significant information is available that documents the status of sensitive habitat in Utah. The Utah Division of Wildlife Resources described the ten most at risk habitat types found in Utah and ranked each by the degree of threat it faces due to various stressors. Ultimately, the BLM must determine and disclose if the resource will be degraded to unacceptable levels given the existing condition of the resource and additive/interactive effects. The public should be given enough information to form an opinion about an acceptable level of resource degradation and provide meaningful comment.	Existing conditions have been documented by resource in the affected environment section. The trend information requested is not specifically known, based on available information. Factors that can influence succession have been identified, but historic changes in vegetation community species composition and extent within these basins have not been documented. BLM has disclosed the risk of resource change based on various influences (such as invasive weeds), and goals for restoration have been identified, based on the vegetation community health standards included in the Ely Resource Management Plan. In some instances, The BLM has not used an acceptable/unacceptable threshold - rather the disclosure is an estimate of changes in the extent and quality of resources with and without the influence of the project.;

Comments and Responses - Federal Government

ID	Comment	Response
35028-222	BLM does not provide enough information to conclude that a loss of 3,065 acres of basin shrubland habitat is a "relatively low level." What percentage of total basin shrubland habitat in Hamlin Valley does that number represent? In the Great Salt Lake desert flow system? What flora and fauna depend on that habitat? This type of information is critical to draw a meaningful conclusion about the loss of basin shrubland in Hamlin Valley under the Proposed Action, Cumulative Effects. This comment applies to all project alternatives in addition to the proposed action.	Thank you for your comment. The conclusion of a "relatively low level" of basin shrubland loss represents a comparison of potential effects with other valleys in the study area, as depicted in the cumulative figures. Compared with Snake Valley (Fig. 3.5-15) the loss of basin shrubland vegetation in Hamlin Valley is comparatively low. Additional NEPA analysis will be performed at the site-specific level in subsequent NEPA tiers. Please see Standard Resource Response Gen-2 for additional information on programmatic analysis and tiering.
35028-223	For Snake Valley, BLM predicts effects (gradual loss) to 49,068 acres of basin shrubland and 1,927 acres of wetland/meadow. What percentage of total basin shrubland habitat in Snake Valley (and the Great Salt Lake Desert Flow System) does that number represent? What flora and fauna depend on that habitat? This type of information is critical to draw a meaningful conclusion about the loss of basin shrubland in Snake Valley under the Proposed Action.	Potential impacts to vegetation have been addressed in Section 3.5.2, Environmental Consequences. Impacts to terrestrail wildlife have been quantified in Section 3.6.2. Additional NEPA analysis will be performed at the site-specific level in subsequent NEPA tiers. Please see Standard Resource Response Gen-2 for additional information on programmatic analysis and tiering.
National Park Service		
34679-1	The NPS believes that the selection of a preferred alternative that does not include a pipeline lateral right of-way into Snake Valley provides the least risk of adverse effects to resources of Great Basin NP. We base this conclusion on the following results of our review of groundwater pumping analyses provided in the DEIS: • Pumping scenarios that exclude proposed pumping from Snake Valley produce the fewest resource impacts in the study area. • Pumping alternatives that exclude proposed pumping from Snake Valley produce the fewest impacts to water resources in Great Basin National Park (Park). • The Central Carbonate Rock Province (CCRP) model is constrained to generate output that represents a best-case scenario on the effects of large-scale groundwater withdrawals on the Park resources. • Pumping in support of the proposed groundwater development project will have substantially more impact on water resources in Snake Valley than existing pumping and reasonably foreseeable future pumping. • Mitigation or avoidance of effects through any implemented monitoring and mitigation plan for Snake Valley pumping would not be effective in protecting Great Basin NP resources. Please refer to the General Comments section for further explanation of the above statements.	Please see standard resource responses MM-1 and MM-2 for information on this topic.
34679-2	Our reviews of the CCRP model documents, the DEIS, and available scientific evidence lead the NPS to conclude that proposed pumping in Snake Valley under the Proposed Action and Alternatives A, B, and C would likely result in unavoidable adverse effects on the water resources and water-dependent resources within Great Basin NP at Rowland Spring, along selected reaches of Lehman Creek, Baker Creek, and Snake Creek, and within the Baker Creek caves system. Based upon our thorough review of both of these model's predictions, we have concluded that predicted impacts from groundwater pumping under the Proposed Action and Alternatives A, B, and C for Snake Valley would be adverse and irretrievable because of the magnitude of the proposed groundwater withdrawals and the proximity of proposed wells to the Park.	Comments noted.
34679-3	The distribution of the proposed wells under these alternatives in Snake Valley is constrained by the location of the Nevada-Utah state line in the western half of the valley, thereby forcing wells to be situated near park resources. The CCRP model predicts that groundwater pumping in Snake Valley would cause declines in groundwater levels that would likely capture spring discharge and streamflows within a few decades after the start of groundwater pumping, even though the CCRP model simulations under the Proposed Action and Alternatives A and C rely on assumed groundwater model parameters at faults that act to limit the propagation of groundwater declines in the direction of park resources. Thus, the CCRP model predictions present a best-case scenario on the possible effects of large-scale groundwater withdrawals on the Park's resources. The best-case scenario predictions in this first tier review suggests that the results of a subsequent tier of NEP A review would, assuming the use of reasonable model parameters, would show increased potential for further impacts to the park and a commensurate high risk of adverse impacts on the Park's resources.	Thank you for expressing your concerns. While statements of opinions do not require specific responses or text revisions under the NEPA regulations, they will be considered by the BLM and documented in the administrative record associated with this EIS.
34679-4	The NPS agrees that monitoring, management, and mitigation measures implemented according to the stipulated agreements between the DOI bureaus and SNW A, would likely be valuable in identifying adverse effects to national park resources from pumping in Spring, Delamar, Dry Lake, and Cave valleys. These agreements rely on early detection of anticipated impacts and modification of pumping to avoid the anticipated impacts before they can occur. However, the DEIS suggests that comprehensive monitoring, management, and mitigation measures proposed for Snake Valley would provide comparable protection of Great Basin NP resources. The hydrogeology of Snake Valley and proximity of proposed pumping to resources administered by NPS are unlike these other basins thus making comparable monitoring, management and mitigation measures infeasible for Snake Valley and NPS does not support taking such approach to protect Great Basin NP resources. The model simulations in the DEIS for pumping scenarios under Alternatives D and E, both of which exclude pumping and a pipeline right-of-way in Snake Valley, clearly represent the least amount of potential impact to water resources in Snake Valley and Great Basin NP. Alternative E represents the fewest potential impacts to national park resources.	Thank you for your comment. Please see Standard Resource Responses MM-1, MM-2 and MM-3.

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ID	Comment	Response
34679-5	Finally, the DEIS demonstrates that the potential development of groundwater in Snake Valley is significantly distant in the future to suggest that the analyses provided in the DEIS will be obsolete after several decades. We believe the selected alternative for the Project should not include a Snake Valley pipeline because substantial additional studies in Snake Valley are needed to inform future NEPA analyses. From these findings, we conclude from the DEIS that the least risk of adverse effects to NPS administered resources is to adopt either Alternative D or E, coupled with the immediate construction of all monitoring wells in the Interbasin Groundwater Monitoring Zone specified by the Spring Valley stipulation agreement. Accordingly, the NPS respectfully requests that the preferred alternative be one that excludes a pipeline lateral right-of-way into Snake Valley.	Your comments have been carefully considered by the BLM when preparing and selecting the agency preferred alternative.
34679-6	The preferred alternative should not include a pipeline lateral into Snake Valley. The available scientific data and modeling simulations indicate that adverse impact to the resources of Great Basin National Park (GBNP) is likely to occur under the Proposed Action, Alternative A, Alternative B, and Alternative C and cannot be prevented with the proposed mitigation measures for Snake Valley. Monitoring, management and mitigation measures, implemented according to the stipulated agreement between the DOI bureaus and SNWA for groundwater development in Spring Valley, are structured to help prevent unacceptable impacts to GBNP resources resulting from pumping in Spring Valley. Similarly, an agreement between the DOI bureaus and SNWA for Delamar, Dry Lake, and Cave Valleys is structured to help provide protection for Lake Mead National Recreation Area (LMNRA) and GBNP. With respect to park resources, these agreements rely on successful early detection of anticipated impacts and modification of pumping to avoid the anticipated impacts before they can affect park resources. Our review of the Central Carbonate Rock Province (CCRP) model and the DEIS leads the NPS to conclude that the proposed groundwater pumping in Snake Valley would likely adversely impact water resources and water-dependent resources within GBNP at Rowland Spring; along selected reaches of Lehman Creek, Baker Creek, and Snake Creek; and in the Baker Creek caves system. This conclusion is largely supported by General Comments 2 through 6 below. Although the DEIS suggests that a comprehensive monitoring plan for Snake Valley, comparable to those of the stipulated agreements for other valleys, will provide the means to avoid or mitigate potential impacts in Snake Valley, such a plan would not be successful in preventing adverse impacts to park resources in Snake Valley. We base this conclusion largely on modeling simulation results presented in the DEIS that strongly suggest the proposed mitigation approaches are likely to be ineffectual due to the limited operating space within the Nevada portion of Snake Valley, and on the drawdown recovery simulations which indicate that even with a redistribution of pumping and a reduction or cessation of pumping, the resource recovery time from the pumping effects would be unacceptable. Moreover, the mere appearance of such plan in this document gives the mistaken impression that the DOI has reached a consensus for such a plan with respect to the resolution of permit applications associated with the proposed groundwater development project in Snake Valley. Please revise the language in the DEIS to clearly indicate that the NPS does not believe that the science supports a conclusion that mitigation of unacceptable impacts to GBNP resources is reasonable with respect to any proposed pumping in Snake Valley by SNWA. Accordingly, we request that the BLM's preferred alternative be one that has no Snake Valley pipeline lateral (Alternative D or Alternative E), as these two alternatives, coupled with proposed mitigation measures in the Spring Valley stipulated agreement, are the only alternatives evaluated that have a good chance to be successful in avoiding of impacts to the resources of GBNP.	Your comments have been carefully considered by the BLM when preparing and selecting the agency preferred alternative. Also, please see section 3.20 in the FEIS for the discussion on mitigation and monitoring. Please see standard resource responses MM-1 and MM-2 for more information on this topic.
34679-7	Pumping scenarios that exclude proposed pumping from Snake Valley produce the fewest resource impacts in the study area. Out of the six pumping scenarios evaluated in the DEIS, Alternatives D and E are the only two pumping scenarios that excluded pumping in Snake Valley. Evaluation of the results presented in the DEIS indicated that when ranked at the full build-out plus 75 years and plus 200 years time frames, Alternative D resulted in the fewest or next fewest impacts to 11 of the 15 resource categories evaluated including: air, water, soils, wildlife, aquatic biologic, land use, recreation, rangeland, special designations, Native American traditional values, and socioeconomics. For the same time frames, Alternative E resulted in the fewest or next fewest impacts to 9 of the 15 resource categories evaluated including: geology, water, wildlife, aquatic biologic, land use, rangeland, wild horses, Native American traditional values, and socioeconomics. Compared to the Proposed Action and Alternatives A through C, all of which included pumping in Snake Valley, Alternative C resulted in the fewest or next fewest impacts to 6 of the 15 resource categories evaluated. All of the other pumping scenarios produced substantially greater impacts to the resource categories evaluated	Thank you for expressing your concerns. While statements of opinion do not require specific responses or text revisions under the NEPA regulations, they will be considered by the BLM and documented in the administrative record associated with this EIS.
34679-8	Pumping scenarios that exclude proposed pumping from Snake Valley produce the fewest impacts to water resources in GBNP. Evaluation of the results presented in the DEIS indicated that at the full build-out plus 75 years and plus 200 years time frames, Alternative E resulted in the fewest impacts to GBNP water resources, as none of the major springs in and around the park would be affected and only 2 miles of perennial streams would be affected. As measured by the extent and magnitude of groundwater drawdown encroachment at the full build-out plus 200 years time frame, Alternatives D and E present the least potential for impairment of NPS resources in Snake Valley.	Thank you for expressing your concerns. While statements of opinion do not require specific responses or text revisions under the NEPA regulations, they will be considered by the BLM and documented in the administrative record associated with this EIS.

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ID	Comment	Response
34679-9	The CCRP model is constrained to generate output represents a best-case avoidance scenario with respect to predicting pumping impacts in the vicinity of GBNP. The revised CCRP model used in the DEIS to estimate regional-scale impacts from the proposed action and various alternatives is based on a conceptualization of the groundwater flow system that likely results in an underestimation of water-level drawdown within national park areas. The CCRP model conceptualization treats selected geologic faults as barriers to groundwater flow. By comparison, the USGS's Great Basin National Park (GBNP) model differs from the CCRP model in that it does not model selected faults in the area as discrete horizontal flow barriers, but instead simulates the hydraulic effect of faults as the juxtapositioning of geologic formations with differing hydraulic properties against each other that commonly results from faulting.	comments noted. There are numerous differences between the CCRP model and GBNP RASA model. The treatment of faults is just one aspect. Regardless of the differences between the modeling approach, the spring and stream flow simulation results of the GBNP RASA model are summarized in the in Section 3.3.2 of the EIS.
34679-10	Pumping in support of the proposed groundwater development project will have substantially more impact on water resources in Snake Valley than existing pumping and reasonably foreseeable future pumping. Evaluation of the incremental and cumulative impact analyses presented in the DEIS indicates that a continuation of existing groundwater pumping under the No Action pumping scenario, and a continuation of existing pumping plus reasonable foreseeable future pumping under the No Action cumulative pumping scenario will have minimal incremental and cumulative impacts on water resources in the project basins. However, when additional pumping under the Proposed Action and Alternatives A through E is introduced into the project basins, the analyses indicate that the cumulative impacts are almost exclusively due to the Project pumping in these basins when compared to the existing pumping and reasonable foreseeable future pumping impacts predicted for these basins. Comparison of the results for the Proposed Action and Alternatives A through E indicate that these impacts will be largely concentrated in Snake Valley and/or Spring Valley, when compared to the other affected valleys.	Based on this comment, text has been added to section 3.5.1.4. Additional information can be found in section 3.3 (water resources).
34679-11	Mitigation or avoidance of effects through any implemented monitoring and mitigation plan for Snake Valley pumping would not be effective in protecting GBNP resources. Results from all six of the pumping scenarios evaluated under the DEIS demonstrate, to differing degrees, the potential effectiveness of implementing the proposed mitigation measures of re-distribution of pumping, and/or reduction or cessation of pumping. Comparison of the results for the Proposed Action and Alternative B suggest that re-distribution of pumping by itself will be ineffective in mitigating pumping impacts in Snake Valley and possibly some of the other project basins, and could produce negative tradeoffs such as increased impacts to perennial water sources and water rights, and an increased reduction in natural groundwater discharge by evapotranspiration. Comparison of the results for the Proposed Action and Alternatives A through C suggest that re-distribution of pumping coupled with a reduction in pumping might be more effective in reducing pumping impacts in Snake Valley, but not enough to avoid adverse impacts to NPS resources. The NPS attributes this result partially to the limited amount of area in Snake Valley in which the SNWA can locate their pumping wells, which will also make it very difficult to successfully implement an early warning monitoring network in the valley. Additionally, while a reduction in pumping may offer some degree of relief to mitigating the pumping impacts in Snake Valley, the BLM's analysis of water level recovery indicates that water levels and spring flows will likely take years to decades to return to a normal or less impaired state. Finally, comparison of the results for Alternatives D and E, which demonstrate avoidance of pumping in Snake Valley and re-distributed and reduced pumping in the other project basins, to the results for the Proposed Action and Alternatives A through C indicate these three measures, in combination, may present the only way to avoid or substantially limit impacts to resources in GBNP and Snake Valley.	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2.
34679-12	Determination of the magnitude of cumulative impacts is incomplete. CEQ guidance on determining the environmental consequences of cumulative effects recommends that determination of magnitude begin with determining the separate effects of past actions, present actions, the proposed action (and reasonable alternatives), and other future actions. Once each separate group of effects is determined, total cumulative effects can be estimated. The DEIS indirectly quantifies the incremental contribution of the Proposed Action (and Alternatives A through E) in the evaluation of cumulative impacts to water resources, but does not address the incremental contributions to cumulative impacts associated with the existing pumping (i.e., No Action alternative) or reasonably foreseeable future actions. Instead the cumulative impact analysis combines the effects of existing pumping and reasonably foreseeable future pumping. As a result, the relative individual contribution of existing actions, proposed actions, and reasonably foreseeable future actions to the total cumulative impact have not been completely determined or discussed as currently presented.	The components of the cumulative analysis for groundwater drawdown can be determined by deducting the No Action (current actions plus foreseeable development under No Action conditions), and the EIS alternative from the overall cumulative effect. The remainder is the contribution from reasonably foreseeable actions that are documented in Chapter 2.
34679-13	The BLM Mission Statement is listed on the inside cover of the DEIS: "The BLM's multiple-use mission is to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations." The DEIS then contains an analysis that the proposed action would have the following effects on BLM resources within 200 years of the project: 191,506 acres of basin shrubland affected (p 3.5-48), 8,048 acres of wetland/meadow affected (p 3.5-48), 525 square miles with a subsidence of greater than 5 feet (p. 3.2-32), 17,107 acres of big game range potentially impacted (p. 3.6-33), over 50 inventoried springs that would be impacted, over 100 miles of perennial streams that would be impacted, and much more. These major effects do not appear to be in line with the BLM Mission Statement.	Please refer to standard resource responses Gen-8, MM-1 and MM-2 for information on this topic.

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ID	Comment	Response
34679-14	Denote Great Basin National Park on all maps. Although GBNP is illustrated on some maps, it is missing from many other figures including the following 2.2-1, 2.5-1, 2.5-3, 2.5-5, 2.5-9, 2.6-2, 2.6-5, 2.6-6, 2.6-7, 2.6-10, 2.6-11, 2.6-12, 2.6-13, 2.6-16, 2.9-1, 3.0-1, 3.1-6, 3.2-2, 3.2-3, 3.2-4, 3.4-1, 3.3.1-6, all of Chapter 3.6, 3.7-1, 3.7-3. The DEIS should consistently represent GBNP on all figures.	Due to the scale of the maps and the variety of resource information that is displayed upon them, it is not practical to show the Great Basin National Park on every map. The GBNP has been added to the first project location figure in response to this comment, as well as most of the figures in Chapter 2, and some figures early in Chapter 3.
34679-15	Section 1.0 - Explanation of NEPA tiering process and associated management decisions lacks clarity on tiering to future actions and pre-conditions that are necessary before construction is allowed to begin. The NPS is concerned that the proposed tiering approach, as currently described in Section 1.3.3, is potentially flawed and might lead to a Tier 1 ROD that has not considered the full direct and indirect impacts associated with the action (as required by NEPA). The tiered approach described in the DEIS would also seem to partially segment the land disturbance impacts (Tier 1) associated with constructing the pipeline infrastructure from the more precise pumping-related impacts (Tier 2). If pumping-related impacts cannot be fully evaluated until future tiered EIS analyses (Tier 2) are completed, then the potential flaw in the current tiering approach is that there is the risk of granting a ROW following the Tier 1 analysis, only to potentially find out in a Tier 2 analysis that pumping impacts in a basin (e.g., Snake Valley) are significant and cannot be mitigated effectively. Under this scenario, a ROW may be is issued and the pipeline constructed (e.g. in Snake Valley) prior to the findings of the Tier 2 analysis. The DEIS needs to explain how this might affect a decision to grant a pipeline ROW into a basin, or how a decision under the earlier Tier 1 analysis might be modified to account for the results of a Tier 2 analysis. The NPS respectfully recommends that the ROW should not be granted, or should be granted with specific pre-conditions, until the degree and magnitude of all related environmental impacts are fully understood. Section 1.3.4 of the DEIS should clearly commit the SNWA to additional environmental compliance and pre-conditions as appropriate, given the BLM's expressed uncertainty with some of the programmatic Tier 1 analysis (e.g., groundwater modeling results and impacts to water resources and other water-dependent resources) which is to be resolved in future tiered analyses.	In response to your comments, Chapter 1 has been revised to clarify the tiering process. Please refer to standard resource responses Gen-1 and Gen-2 for information on this topic.
34679-16	The NPS respectfully recommends that Section 1.3.4 of the DEIS be amended to clearly state that all water rights permits must be secured prior to authorization of any project-related activities. Section 1.3.4 does not indicate that the ROD and/or Notice to Proceed will contain a requirement that project-related water rights must secured in the proposed project basins prior to the commencement of any construction activities. This is of particular concern to the NPS for any of the proposed ROW actions that might include a pipeline lateral into Snake Valley. Figure 2.5-6 in Chapter 2 of the DEIS clearly demonstrates that in the event a pipeline ROW would be granted in Snake Valley under the Tier 1 analysis, the SNWA would not be prevented from constructing the pipeline lateral into Snake Valley before there is a resolution of the SNWA's water rights applications in Snake Valley. The DEIS acknowledges the uncertainty of when SNWA water rights applications in Snake Valley will be resolved. The NPS is concerned that any approval of a ROW for a lateral pipeline in Snake Valley prior to a water rights hearing on the SNWA applications would unduly influence the State of Nevada's consideration of the applications, and, thereby, unduly influence the outcome of protests (including the protests by the NPS) of the water rights applications.. Such a condition in the ROD and/or Notice to Proceed would also protect the SNWA and rate payers from expending resources until the outcome of these applications is determined.. Finally, NPS believes it would be imprudent to approve this pipeline segment given that the Project anticipates this segment will not be needed for at least 25 years, as illustrated in Figure 2.5-6.	Thank you for your comment. Your comment topic will be considered by the BLM during preparation of the Final EIS and Record of Decision
34679-17	Section 2.0 -Utility corridors do not extend to all proposed points of diversion (Alt. B) or to Groundwater Development areas (Alt. A, C, E). The proposed action and alternatives do not consider all utility corridors needed to fully develop the proposed Project. The Groundwater Development Area for Snake Valley goes north of Highway 6/50, yet none of the utility corridors extend north of the town of Baker. Likewise in Spring Valley, the utility corridor stops far short of the northward extent of the Groundwater Development Area. However, Figure 2.5-2 shows that for Proposed Action and Alternative A, the pumping distribution would proceed north of Highway 50 in both valleys. This would necessitate a longer ROW and possibly more ancillary facilities, and these are not mentioned in the text. If the proposed action includes these areas, the ROWs and ancillary facilities need to be adjusted accordingly so that proper analysis of their effects can be evaluated. These include additional roads, power lines, stream crossings, and viewshed issues. Therefore, the additional ROWs needed to connect all facilities would require additional NEPA compliance and, based upon the level of controversy, these would require additional EIS analysis. This issue appears to be a procedural error and inconsistent with CFR 40 15001.1 (b) NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail.	These facilities are not part of the proposed action and alternatives They are addressed programmatically in this document to set the stage for subsequent treatment under NEPA. Appropriate subsequent NEPA analyses will be completed prior to construction of ancillary facilities. The FEIS addresses the action in question (request for a ROW grant) and programmatically addresses future facilities and potential water drawdown.
34679-18	Section 3.1 – Air Quality Concerns. In general, we commend the BLM for the improvements in the air quality section of the DEIS, in particular in providing more information about the possible impacts of groundwater drawdown and recommending that monitoring, mitigation, and management be implemented prior to the initiation of the project.	Please refer to standard resource responses Air-7, Air-9, MM-1 and MM-2 for information on this topic.

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ID	Comment	Response
34679-19	Section 3.3 - The revised Central Carbonate-Rock Province numerical groundwater flow model (CCRP model) used in the DEIS continues to be based on a conceptualization that results in under-estimating impacts, and is inadequate in making site-specific predictions of whether or not national park resources will be impaired. The revised CCRP model used in the DEIS to estimate impacts from the proposed action and various alternatives continues to be based on a conceptualization of the groundwater flow system that results in an underestimation of water-level drawdown within national park areas. This conceptualization treats selected geologic faults as barriers to groundwater flow without supporting peer-reviewed evidence. In addition, other questionable assumptions in the conceptual model remain, as detailed in NPS comments to the administrative draft version of the EIS and an accompanying letter report by GeoTrans, Inc. with whom the NPS contracted for a critical review of the latest version of the model. GeoTrans, Inc. concluded that: (1) "The model contains a bias toward underpredicting the effects of pumping from the groundwater system." and (2)"Improvements to the model are needed before using it as a basis for analysis of impacts on resources that are located close to proposed pumping locations." (GeoTrans, Inc., written communication, Dec 23, 2010). Although the BLM has accepted the CCRP model "… for the purposes of estimating the nature and magnitude of potential impacts and for comparing alternatives …" presented for the proposed Project, the NPS notes that the model might be adequate for a generalized estimate of regional impacts, but it is not adequate to delineate unaffected areas from the proposed action and various alternatives or to make site-specific predictions of whether or not nearby resources will be adversely affected. This is especially true in Snake Valley, where proposed groundwater pumping locations are within 5 miles of GBNP.	See response WR-1 regarding the use of the model simulated 10-foot drawdown for the programmatic analysis of potential effects to water dependant resources; and WR-4 regarding the representation of faults in the groundwater flow model.
34679-20	Section 3.3 – CCRP model contains spurious simulated flow barriers. There is an over-reliance on conceptualizing faults as barriers to groundwater flow, based solely on geologic criteria, without regard to hydrology, especially hydraulic gradients. This bias is carried forward into the numerical model and is not based on peer-reviewed science confirming their existence at these locations. Much evidence suggests that the hydrologic effects of geologic faults are complex and are the result of many factors. The latest version of the numerical model still contains simulated horizontal flow barriers (HFB's) in several places, often near large springs and without ample scientific justification, i.e. peer-reviewed science, for their existence and inclusion at these locations. These barriers limit the propagation of water-level drawdown unreasonably. For example, in Snake Valley, the model contains a spurious HFB between one of the major pumping centers and GBNP, which prevents most of the simulated drawdown from propagating into the park, in the areas of Lehman and Baker Creeks and Rowland Spring, and causing the likely depletion of these and other similar surface water features in and adjacent to the park. This is not reasonable, and is not supported by the preponderance of available science. The only spurious HFB that has been addressed in the latest version of the numerical model was the HFB located between the proposed pumping center and Big Springs, which is located adjacent to GBNP and is the largest spring in all of southern Snake Valley. The revised treatment of this particular spurious horizontal flow barrier caused the latest version of the numerical model to predict substantially more drawdown and the depletion of flow at Big Springs in all of the proposed pumping scenarios, except Alternative E, which still showed a considerable reduction in flow at Big Springs. The revision of all other HFB's near the boundary of GBNP (and HFBs in other areas of the model) will likely result in increased drawdown and depletion of flow in the areas of Lehman and Baker Creeks and Rowland Spring.	See Response WR-3 regarding the representation of faults in the groundwater flow model.
34679-21	Section 3.3 - Rowland Spring is not contained in the CCRP model. Rowland Spring, the largest discharge spring in GBNP, is located within 5 miles from pumping centers proposed in Snake Valley, and is not included in the CCRP model. Therefore, quantitative estimates of "model predicted changes in springflow" are not provided for this spring or Spring Creek Spring (located immediately adjacent to the park near Snake Creek) even though estimates are provided for several smaller discharge springs located farther from proposed pumping. These two springs should be included in the CCRP model, and "model predicted changes in springflow" calculated for the proposed action and alternatives, to assist in the assessment of potential effects to resources within and adjacent to the park. Minimally, the BLM should at least insert an observation well into the CCRP model near Rowland Spring to further assist in the assessment of the risk of adverse drawdown effects to resources within and adjacent to GBNP in the final EIS.	The potential risk of flow reductions at all identified springs within the drawdown area were addressed in the EIS including Rowland Springs and Spring Creek Spring that are specifically addressed for each alternative.
34679-22	Section 3.3 - The DEIS only depicts potential effects in areas having a predicted drawdown of 10 feet or more. Given hydrologic evidence elsewhere within the Great Basin that drawdown of less than 10 feet can have substantial effects on springs and streams, the CCRP model's inability to accurately predict drawdowns of less than 10 feet, we question the value of the effects analysis as it pertains to determining whether NPS-administered resources are at risk. It is evident that less than 10 feet of drawdown can cause springflow declines, as discussed in the results of "model-simulated changes in springflow" at selected springs. The results indicate clearly that model-simulated springflows decline substantially outside of the 10-foot drawdown area. The NPS notes that the "10- foot drawdown threshold" might be adequate for a generalized estimate of regional impacts, but it is inadequate to delineate areas unaffected from the proposed pumping or to make site-specific predictions of whether or not nearby resources will be impaired by lesser drawdown. The NPS will expect this issue to be addressed in more detail in any subsequent tiered NEPA analyses using the refined groundwater models that have been proposed in the DEIS.	See response WR-1 regarding the use of the model simulated 10-foot drawdown for the programmatic analysis of potential effects to water dependant resources.

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ID	Comment	Response
34679-23	Section 3.3 – The CCRP model simulates too much groundwater flow to Lake Mead. The latest version of the numerical model still vastly overestimates the annual amount of groundwater discharge from the regional groundwater flow system into Lake Mead, principally beneath the Muddy River Valley. As NPS and USGS have repeatedly stated, the preponderance of evidence is contrary to this assumption. The overestimated discharge has the effect of underestimating the potential incremental and cumulative drawdown effects to springs at LMNRA, resulting from the proposed and reasonably foreseeable groundwater development projects.	Thank you for expressing your concerns. While statements of opinions do not require specific responses or text revisions under the NEPA regulations, they will be considered by the BLM and documented in the administrative record associated with this EIS.
34679-24	Section 3.3 - Simulation of Lincoln County Water District pumping is needed. Proposed groundwater pumping of 33,000 afy by and on behalf of Lincoln County Water District (LCWD) to be conveyed by the Project pipeline is identified as part of the "proposed action", but is not included in the numerical groundwater modeling simulations or on the water-level drawdown maps. The additional water to be pumped by and on behalf of LCWD and conveyed in the proposed pipeline was the main reason that the scoping process for this EIS was re-done in 2006. Even if there is uncertainty about the timing or final location of this development, it should be included in the numerical groundwater modeling analysis, preferably as part of the Proposed Action, or at least as a reasonably foreseeable project using the points of diversion (PODs) identified in the LCWD water rights applications. Once the timing and location uncertainty is resolved in the future, the analysis can be re-visited and refined under a modified Tier 1 EIS or a subsequent Tier 2 EIS.	See discussion provided in section 2..1.1 of the EIS regarding pipeline conveyance volume. In summary, there is insufficient information to adequately characterize and analyze the 21,700 afy of Lincoln County in this EIS. Independent NEPA analysis would be required if, and when Lincoln County provides information to the BLM regarding this development.
34679-25	Section 3.3 – Simulation of SNWA's pending applications in Coyote Spring Valley is needed. The effects of pumping of SNWA's pending water-rights applications in Coyote Spring Valley (up to 27,512 afy) are not in the DEIS as a reasonably foreseeable groundwater development project. These applications were formerly part of the proposed project for many years, and were the subject of a water-rights hearing in 2001 (they are currently being held in abeyance by the Nevada State Engineer until further information is available about pumping effects in Coyote Spring Valley). However, the effects of pumping of SNWA's pending applications in Snake Valley (up to 50,680 afy) is considered in the DEIS as part of the "proposed action", even though these applications have been protested by many entities, including the NPS, and have not yet been considered in a water-rights hearing. Similarly, the effects of pumping by LCWD and Vidler Water Company in Clover Valley are considered as reasonably foreseeable groundwater development projects, but their applications have not yet been considered in a water-rights hearing. The selection of reasonably foreseeable groundwater developments appears to be subjective.	During the development of the model, it was determined that Coyote Springs pumping by SNWA would not be a reasonable foreseeable action. This determination was made through consultation with SNWA and other agencies and supporting information on this criteria is contained in the FEIS in chapter 2. The FEIS shows those actions that BLM determined to be reasonable foreseeable at the time of the analysis. However, future tiers of water development and NEPA will allow the opportunity to add or subtract additional valleys and pumping situations for analysis review. Future analysis can further define potential impacts with additional data and a better understanding of the future.
34679-26	Section 3.3 – Estimates of the magnitude, timing, and areal extent of recovery of water-level drawdown after cessation of pumping needs to be displayed with the CCRP model. If adverse effects occur, those effects will not immediately cease if pumping stops. As a result, water-dependent ecosystems might suffer irreparable harm before water levels recover fully. Currently, the DEIS relies on only a single water level recovery simulation as the basis for evaluating these concerns. The groundwater flow model should be used to provide additional predictive estimates of the magnitude, areal extent, and timing of residual drawdown after pumping stops under each pumping scenario. Although the extent of the 10-foot drawdown area was displayed in an appendix to the DEIS for one of the pumping alternatives, a depiction of the full extent and magnitude of the delayed response is needed for all of the pumping scenarios to more fully evaluate this phenomenon in each case. This is especially important because monitoring, management, and mitigation measures were specifically devised to address these adverse drawdown effects. Additionally, the effects of delayed water level recovery on the proposed mitigation measures should be discussed in more detail in the Final EIS.	Additional cessation runs have not been added to this Final EIS, although they may be considered for addition in subsequent NEPA modeling. Please see Standard Resource Response Gen-1 which discusses programmatic analysis and subsequent NEPA.

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ID	Comment	Response
34679-27	Section 3.3 – Cumulative effects of all reasonably foreseeable nearby groundwater development not simulated. The latest version of the numerical model does not include the entire area of the upper Great Salt Lake Desert (GSLD) Flow System in which GBNP is situated. Pine, Wah Wah, Tule, and Deep Creek valleys and Fish Springs Flat are excluded from the modeled area. Thus, the model is incapable of estimating cumulative effects in the Upper GSLD Flow System, including proposed groundwater withdrawals by the Central Iron County Water Conservancy District, Utah (CICWCD) in Pine, Wah Wah, and Hamlin valleys within the Upper GSLD Flow System. These simulations were not included in the "Cumulative-Effects" section, even though 10 feet of drawdown or greater is experienced throughout much of Hamlin Valley and at the model boundary with Pine Valley 75 years after full build-out for the Proposed Action, Alternative B and Alternative D pumping scenarios, and 200 years after full build-out for the Alternative A and Alternative C pumping scenarios under the incremental impact analyses. In the cumulative impacts analyses, with few exceptions, drawdown of 10 feet or greater is experienced at the model boundary with Pine Valley either 75 years or 200 years after full build-out for nearly all of the pumping scenarios. It is the NPS's understanding that the BLM would revisit the extent of the model domain if drawdown reached the current model boundary by the 75 years after full build-out time period. It does in several cases. The NPS recommends that the model domain be extended to include Pine, Wah Wah, Tule, and Deep Creek valleys and Fish Springs Flat in the numerical model, so that effects of the CICWCD applications can be analyzed in the Cumulative Effects simulation. Water-rights hearings were held regarding these applications in Spring 2010, indicating that this project is reasonably foreseeable. Additionally, the SITLA applications in Snake Valley, Utah, have not been simulated in the "Cumulative Effects" section. The latest version of the numerical model also does not include the entire area of the lower Colorado Groundwater Flow System (Lower Colorado System) in which Lake Mead NRA is situated. Tule Desert (HA #221) and Lower Virgin Valley (HA #222) are not included in the modeled area. Reasonably foreseeable groundwater developments have not been simulated in these valleys, including groundwater rights held by the Lincoln County Water District and Vidler Water Company in Tule Desert (HA #221), and various prospective water developments in Lower Virgin Valley (HA #222). The model is currently incapable of estimating all cumulative effects of reasonably foreseeable groundwater development projects in the Upper GSLD Flow System and in the Lower Colorado System, because these areas are not represented in the model area	See response WR-6 regarding the model boundary and evaluation of impacts to basins located east of Snake Valley. Other basins adjacent (and outside) the southern region of the model do not need to be included since potential effects associated with this project are not projected to extend into these areas.
34679-28	Section 3.3 and Appendix B – Snake Valley 3M plan likely to be unsuccessful at mitigating pumping impacts in GBNP. Two of the mitigation measures in the proposed Snake Valley 3M Plan (geographic re-distribution of groundwater withdrawals and reduction or cessation in groundwater withdrawals) are postulated by BLM as offering the best solution for minimizing adverse impacts to the water resources in Snake Valley. The DEIS states that "a long-term reduction in surface discharge at perennial surface water source areas is likely to occur in some areas even after implementation of the SNWA proposed adaptive management measures and proposed mitigation measures," and that such reduction in surface discharge is considered "an unavoidable adverse impact" associated with the proposed groundwater development project. These statements confirm that cessation or reduction of pumping would be ineffective mitigation measures to offset the long-term impacts to surface water and groundwater resources in the area, and are supported by analysis of the recovery of water levels, which indicates water level recovery could take several years or decades to occur. Furthermore, the re-distribution of pumping as a mitigation measure is greatly constrained in Snake Valley, given the smaller amount of available space located within the Nevada portion of the valley, and that pumping distribution has been maximized in the pumping scenarios evaluated. The space constraints in Snake Valley not only hamper the effectiveness of this mitigation measure, but also the successful implementation of early detection monitoring in Snake Valley.	Please see Standard Resource Responses MM-1 and MM-2.
34679-29	A comparison of the model results for the Proposed Action and Alternatives A, B and C, strongly suggests that implementation of geographic re-distribution of groundwater withdrawals and reduction or cessation in groundwater withdrawals in Snake Valley will not be effective at avoiding adverse impacts to the GBNP water resources. The results suggest that re-distribution of pumping by itself will be ineffective in mitigating pumping impacts in Snake Valley and several of the other project basins, and could produce negative tradeoffs such as increased impacts to perennial water sources and water rights, and an increased reduction in natural groundwater discharge by evapotranspiration. The results also suggest that re-distribution of pumping coupled with a reduction in pumping might be more effective in reducing pumping impacts in Snake Valley, but not enough to avoid impairment of NPS resources. Given that adverse impacts to the park resources related to pumping in Snake Valley are unlikely to be avoided, the Proposed Action and Alternatives A, B and C are unacceptable to the NPS. As a result, the NPS believes the BLM should select an alternative to the Proposed Action that avoids pumping in Snake Valley.	Thank you for expressing your concerns. While statements of opinions do not require specific responses or text revisions under the NEPA regulations, they will be considered by the BLM and documented in the administrative record associated with this EIS.

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ID	Comment	Response
34679-30	Section 3.5.1 Affected Environment – The DEIS could be made substantially stronger in this section by the addition of more appropriate wetlands data. Only the USGS SWRegion GAP data are presented, which do not include a category for wetlands land cover. Addition of references, data, and maps from the National Wetlands Inventory and the State of Nevada Priority Wetlands Inventory of 2007 would provide readers with a much better understanding of location and area of wetlands that could potentially be affected by groundwater development and pumping. The NPS recommends including non-jurisdictional wetlands in the affected area descriptions. The NPS believes use of the term “marshland” instead of accurately describing areas as wetlands might not provide the public with a complete concept of the vegetation cover types and habitats that could be affected by alternative actions within the DEIS. Non-jurisdictional wetlands are an important habitat type in the Desert Environment of the Great Basin and provide crucial links for migratory birds and support local wildlife. A table indicating total wetlands area potentially affected by each alternative would be critical to properly inform the public.	Thank you for your comments. Use of the Soutwest ReGAP dataset, in conjunction with other data sources, is discussed in detail in response VEG-4. Wetlands outside of the proposed project right-of-way have not been delineated, thus determinations on jurisdiction have yet to be determined. The analysis conducted did not consider jurisdictional status, but rather considers all potential wetlands in the Study Area . The term "marshland" was used in the USGS report (Smith et al. 2007) referenced in this section, and properly defined in this EIS in Table 3.5-7. Additional site-specific wetlands analysis will be conducted during subsequent NEPA. Impact summary tables indicating potential wetland acres affected by each alternative are located in Section 3.5.2.
34679-31	Section 3.15 - Visual Resources not adequately analyzed for GBNP. Section 3.15 states correctly that “unobstructed views in Spring and Snake valleys are cited as extremely important to the visitor’s experience at GBNP (NPS 1992).” Additional information is given about how dark skies are an important consideration for travelers making their plans (p. 3.15-10). However, the analysis of visual resource impacts is incomplete. For example, on page 3.15-19, last paragraph, it is stated that “Lighting to support project operation would be needed throughout the life of the project and would likely be less intense and less frequent than the typical effects of a single family residence; therefore new light sources would pose negligible impacts to nighttime viewsheds.” This conclusion does not fully consider the current night sky conditions in Spring and Snake Valleys and does not take into account the possible changes in night sky viewing or on wildlife such as bats, nighthawks, or other species. A second example of inadequate visual resource analysis is on page 3.15-21, the third complete paragraph, which describes that “the project would not be visible from the Lehman Caves Visitor Center, the Lehman Caves, and primitive and developed campgrounds along the Snake Creek.” It is not disclosed that the Project would be very visible from the Great Basin Visitor Center (located in Baker, NV) and to visitors traveling to and from the park entrance. Finally, the groundwater development area shown throughout the DEIS in Snake Valley extends alongside and to the north of the town of Baker. The Plan of Development shows that the pipeline right of way and ancillary facilities terminate south of the town of Baker. Additional Project development under the Proposed Action and Alternatives would result in Project facilities that would be visible from the Lehman Caves Visitor Center and Lehman Caves.	Thank you for your comment. Applicant committed measures would, in part, mitigate your concerns. Section 3.15 (visual resources) has been updated and revised based on your comment and others.
34679-32	Section 3.19 - Soundscapes are not adequately considered. Although Noise is considered in Chapter 3.19, soundscapes are not analyzed in the DEIS. In accordance with 2006 Management Policies (NPS 2006) and Director’s Order 47 Sound Preservation and Noise Management, an important component of the NPS’s mission is the preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among National Park Service units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas. Soundscapes are a critical part of a visit to NPS areas. Under the proposed Project, years of construction activity would affect GBNP soundscapes.	No project related noise impacts from construction are anticipated within NPS boundaries based on the long distances from work areas to the NPS boundary, and therefore no analysis of soundscapes within Park boundaries is needed.

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ID	Comment	Response
34679-33	As part of providing opportunities for quiet recreation, the BLM must consider activities that interfere with the soundscape associated with quiet recreation opportunities. Research shows that for many people, the primary reason for visiting primitive landscapes is to attain a sense of solitude and tranquility, which are interrupted by non-natural noises. A study performed by psychologists at Colorado State University found that acoustic stressors impact visual landscape quality, meaning non-natural noise actually affects the perceived naturalness of a landscape (Mace 1999). Furthermore, the authors of the Colorado State University study note that “tranquility” and “solitude” are explicitly addressed in the Wilderness Act as values that must be preserved by land management agencies. Similarly, BLM guidance directs the preservation of “naturalness” in Wilderness Study Areas, Visual Resource Management I zones, and other areas managed to protect wilderness qualities. All of these values are negatively impacted when the natural soundscape is impacted. Therefore, preservation of the natural soundscape is a necessary part of preserving the naturalness of an area, and is especially important in management of wilderness-quality lands and primitive recreation areas. As an example of how to effectively and appropriately achieve this goal, the Colorado BLM issued “A Recreation and Visitor Services Strategy” (“Recreation Strategy”; available on-line at: http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/recreation.Par.23531.File.dat/Rec%20Strategy.pdf) to help field offices provide quality recreation experiences for all users. The Recreation Strategy recognizes that BLM’s obligation to provide recreation areas for many user types requires designation of quiet recreation zones. It defines “quiet recreation” as “Outdoor recreation enthusiasts such as hikers, skiers, mountain bikers, equestrians, bird watchers, hunters and anglers who seek the opportunity to enjoy natural soundscapes” (p. 17) (emphasis added). Additionally, courts have upheld the responsibility of federal land management agencies to evaluate noise impacts on the natural soundscape. See Izaak Walton v. Kimbell, 516 F. Supp. 2nd 982, 985, 995-96 (D. Minn. 2007) (EA prepared by USDA Forest Service for plan to construct snowmobile trail adjacent to Boundary Waters Canoe Area Wilderness failed to properly analyze noise impacts from snowmobile use, as required by the NEPA; EA provided no quantitative evidence of analysis of decibel levels to be projected by snowmobile use of the trail into adjoining wilderness). As stated previously, the ROW and ancillary facilities in Snake Valley do not extend to all the groundwater development areas. Thus to say on page 3.19-3 in #4 that “the nearest Baker residence to the terminus of the Snake Valley pipeline and power line is estimated to be 1.5 miles” is misleading. In order to access the thousands of acres of groundwater development area to the north of Baker, pipelines and power lines will have to be extended past the town of Baker, and the proponent needs to reveal this information now so that it can be adequately analyzed.	While construction noise generated from construction activities may be noticed in nearby Wilderness Study Areas, the duration of these noise increase would only occur during the construction period (a few months). No long-term noise sources (pump stations) would be located sufficiently near designated noise sensitive areas to change the soundscape environment for dispersed recreation (See Page 3.19-8).
34679-34	The DEIS states: “followed by the completion of the Snake Valley lateral and pump stations in 2023.” However, in Figure 2.5-6 Snake Valley groundwater development is scheduled for 2050. Would pipe and pumps sit there not in use for as long as 27 years? Would this potentially bias the State Engineer’s decision about granting the SNWA water rights in Snake Valley?	The BLM cannot speculate on the influences to the NSE decisions,
34679-35	The draft EIS states: “Due to the controversial nature of this project, the BLM is particularly interested in seeing comments and suggestions for the analysis of the Snake Valley portion of the proposed project and identification of impacts to resources in the area, especially to those in Great Basin National Park.” The NPS requests that appropriate sections of the Great Basin National Park enabling legislation be referenced. Public law 99-565 established Great Basin National Park “to preserve for the benefit and inspiration of the people a representative segment of the Great Basin of the Western United States possessing outstanding resources and significant geological and scenic values.” It further stated that, “the Park Service is to protect, manage and administer the park in such a manner as to conserve and protect scenery, the natural, geologic, historic and archeological resources of the park, including fish and wildlife and to promote for the public use and enjoyment of the same in such a manner as to perpetuate these qualities for future generations.”	Based on your comment, text has been added to Chapter 1.
34679-36	Please clarify if the pink line labeled “alignment option” is for the power line or the pipeline.	The pink lines denote optional alignments for either or both the pipeline and power line in that area. Due to the map scale, no distinction is made on the map. These alignment options are explained in the text of the EIS.

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ID	Comment	Response
34679-37	The discussion in subsection 1.3.4 on the Bureau of Land Management Decisions – Tier 1 lacks clarity on several issues and concerns that the NPS has with respect to the tiering process and management decisions that would result from Tier 1. The NPS respectfully requests that additional discussion be included in this subsection to address the following issues and concerns: • If a right-of-way (ROW) for the groundwater pipeline infrastructure is granted under Tier 1, will the SNWA be allowed to start construction activities before securing their water rights? The NPS respectfully requests that Section 1.3.4 contain language that clearly requires the securing of all water rights permits before a ROW is granted for any aspect of the proposed Project. This is of particular concern to the NPS for any of the proposed ROW actions that might include a pipeline lateral into Snake Valley. Language in Section 1.3.4 is needed to explain how a ROW Grant and/or Notice to Proceed would be structured to address all pre-construction activities including acquisition of water rights in the proposed project basins prior to being allowed to construct their groundwater pipeline and associated facilities in these basins. The NPS also requests providing similar language in Section 2.4 (lines 1-3), where the discussion centers on the BLM's ability to impose conditions on any ROW grant that it permits for the Project. The timeline presented in Figure 2.5-6 in Chapter 2 of the DEIS clearly demonstrates that in the event a pipeline ROW would be granted in Snake Valley under the Tier 1 analysis, the proposed Project could proceed with the construction of the pipeline lateral into Snake Valley prior a resolution of the water rights applications in Snake Valley. The timeline clearly shows construction of the Snake Valley pipeline lateral between 2020 and 2023, and that the Tier 2 NEPA process and well drilling in Snake Valley would occur between 2042 and 2050, with no qualification that such timeline would be contingent upon the acquisition of water rights in Snake Valley during these timeframes. We do note the DEIS (page 1-8) acknowledges that the scheduling of a hearing to resolve the SNWA's water rights applications in Snake Valley is currently unknown. The water rights issue in Snake Valley is further complicated by the fact that the LCCRDA requires Nevada and Utah to agree to an equitable apportionment of the water resources in Snake Valley. Under the latest draft of the Nevada- Utah agreement, there was language (see lines 7-9, page 2-15 of DEIS) specifying the Nevada State Engineer (NSE) will not schedule a Snake Valley hearing for a period of 10 years, following execution of the agreement. During this period, SNWA would be expected to conduct additional studies and collect data on the Snake Valley aquifer and groundwater availability (unclear if this is in support of Tier 2 NEPA analyses). If such agreement with the above condition were signed in 2012 a hearing on the SNWA water right applications in Snake Valley would not occur until 2022-23, which would conflict with the Project schedule shown in Figure 2.5-6. As shown, there is potential to have the pipeline lateral in the ground and awaiting approval (or disapproval) of their water rights applications by the NSE.	The NSE has ruled on the water rights for Spring, Dry Lake, Delmar and Cave valleys. Preconstruction requirements will be specified in the Record of Decision for this Final EIS. Line 4 of section 2.4 highlights the use of the ROD to impose specific conditions prior to issuing a notice to proceed with construction activities.
34679-38	The NPS is concerned that the above scenario would unduly influence the NSE's decision on the SNWA applications in Snake Valley. It would also unduly interfere with the ability of protestants of these applications, including DOI bureaus, to protect resources and their existing water rights in Snake Valley. Conversely, a requirement to withhold issuance of any ROW and/or Notice to Proceed would protect the SNWA and rate payers from expending considerable amounts of money to construct the pipeline lateral into Snake Valley until the water rights applications are resolved by the State of Nevada.. Since the Snake Valley lateral pipeline would not be needed for more than 25 years, which is the current projection presented in Figure 2.5-6, the Snake Valley pipeline should not be approved as part of the proposed Project.	The NSE has ruled on the water rights for Spring, Dry Lake, Delmar and Cave valleys. Preconstruction requirements will be specified in the Record of Decision for this Final EIS. Line 4 of section 2.4 highlights the use of the ROD to impose specific conditions prior to issuing a notice to proceed with construction activities.
34679-39	• If a ROW for the mainline groundwater pipeline infrastructure is granted under Tier 1, will the decision be final or conditional upon completion of future NEPA analyses under subsequent tiers? Given the discussion on the programmatic analysis conducted under Tier 1 related to pumping-related impacts, and the high degree of uncertainty in the water resource impact analysis as expressed in Section 3.3 of the DEIS, the NPS is concerned that a final pipeline ROW can be granted at the Tier 1 stage and construction would be allowed to commence. In Section 3.3, the uncertainties and limitations of the groundwater model and its results are discussed, and it is stated that these uncertainties and limitations will be addressed and refined in subsequent tiered EIS analyses after detailed groundwater development plans are submitted. If pumping-related impacts cannot be fully evaluated until future tiered EIS analyses (Tier 2) are completed, then the potential flaw in the current tiering approach is that a Tier 2 analysis may conclude that effects of pumping (e.g., in Snake Valley) are locally significant and cannot be mitigated effectively. Under this scenario, there is a risk that the Tier 1 review may lead to ROW approval followed by a Tier 2 analysis that concludes such approval is in error. Examination of the project timeline presented in Figure 2.5-6 shows that Tier 2 NEPA analyses will be completed half way through the construction of the Cave Valley lateral pipeline, 5 to 22 years after the completion of the Spring Valley lateral pipeline, and 24 years after the completion of the Snake Valley lateral pipeline. The DEIS does not indicate how the above situation would be addressed The NPS respectfully requests that the decision to grant a ROW be withheld until the degree and magnitude of all related environmental impacts are fully understood following the completion of future tiered EIS analyses. Section 1.3.4 of the final EIS should more clearly articulate that any decision to grant ROW is contingent on subsequent environmental analyses in future tiered analyses. The NPS also requests providing similar language in Section 2.4 (lines 1-3), where the discussion centers on the BLM's ability to impose conditions on any ROW grant that it permits for the Project.	Changes have been made in the FEIS text to address the central concern that underlies this comment; however, due to its overarching nature, specifics regarding the placement of changes in the FEIS are not provided in this response.

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ID	Comment	Response
34679-40	In summary, the NPS is concerned that the proposed tiered approach, as currently described, is potentially flawed and might lead to a Tier 1 ROD that has not considered the full direct and indirect impacts associated with the action (as required by NEPA). The current tiered approach also would seem to partially segment the land disturbance-related impacts (Tier 1) from the pumping-related impacts (subsequent tiers). Care must be taken to assure the public that construction in the pipeline ROW will not be allowed to proceed, or at least will be granted with specific pre-conditions, until all water rights and regulatory permits are secured, direct and indirect impacts associated with land disturbance and groundwater pumping are known, and all other pre-conditions and requirements that may accompany the ROD are fulfilled.	Changes have been made in the FEIS text to address the central concern that underlies this comment; however, due to its overarching nature, specifics regarding the placement of changes in the FEIS are not provided in this response. Please see standard resource responses Gen-1 and Gen-2.
34679-41	Please clarify the first sentence of the paragraph in lines 29 and 30 on page 1-6, which states “Before a Notice to Proceed is issued, the ROW holder would be responsible for ensuring that all NEPA requirements are up-to-date.” Does this include completing Tier 2 NEPA analyses associated with the groundwater development components of the project? In addition, please clarify the statement’s reference to “ensuring NEPA requirements are up-to-date.” This suggests that there is a timeframe within which the NEPA analysis is valid. Is this reference tied to the statement in lines 27 and 28, which refers to the requirement that “construction in a ROW must be initiated within 5 years of issuance of the ROW,” or is it tied to the discussion in lines 31-34, which cautions that “A delay in project implementation of even a few years could result in the need to supplement the NEPA (EIS) process and associated processes…”?	In response to your comments, Chapter 1 has been revised.
34679-42	If the SNWA is allowed to develop their pending applications in Coyote Spring Valley (27,500 afy) in the future, please provide clarification in the discussion on how the SNWA plans to convey this additional water to Las Vegas. If these plans include conveyance in the pipeline being considered under this EIS, will the incremental and cumulative impacts be assessed in a tiered EIS or will a supplemental EIS be prepared? If the SNWA’s plan is to seek intentionally created surplus credits for this water and convey the water to Bowman Reservoir in the pipeline recently constructed to convey their existing water rights in Coyote Spring Valley for the same purpose, please elaborate on how the pumping-related impacts might be assessed in a future NEPA action. Absent a clear statement of intent to not associate the SNWA’s proposed pumping in Coyote Spring Valley of 27,512 afy with the Proposed Action, the re-filing of water-rights applications for this proposed pumping in 2010 by the SNWA leads the NPS to believe that the SNWA still has plans for this water and that potential conveyance of these unresolved water rights from this basin can only be accommodated by the pipeline proposed under the Proposed Action.	Please see “Other Water Rights and Applications” in Section 1.4.1.1 for a discussion regarding the SNWA 27,500 afy applications in Coyote Spring Valley. As stated in that section, those applications are not included in this GWD Project.
34679-43	The BLM not only must recognize that there are different opinions among experts and agencies, but they are also required to disclose such differences. Large sections throughout the document fail in this regard.	Based on this comment, information has been added to section 3.3 (water resources) and section 1.3.1.
34679-44	It’s important to note that mitigation and monitoring can only be related to site-specific actions, in this case the pipeline. Mitigation for future conceptual actions would not be sufficient, just as this EIS is not sufficient to cover those actions.	Thank you for your comment. Please see Standard Resource Response MM-1.
34679-45	In the Quick References, please add the acronyms GBNP (Great Basin National Park) and NPS (National Park Service). As previously requested in both administrative drafts of the EIS that the NPS reviewed, the BLM still has not included the NPS in the list of acronyms even though all other cooperative agencies are.	GBNP - Greta Basin National Park and NPS - National Park Service have both been added to the Quick Reference in Chapter 2.
34679-46	Please disclose that Alternative D is the only action that Congress required the BLM to consider in the LCCRDA.	This is addressed in Section 1.3.1.
34679-47	With respect to the first bulleted discussion under the section titled Pipeline Conveyance Volumes, the NPS is concerned that the pumping impacts related to the SNWA’s existing agricultural water rights in Spring Valley are not being evaluated as part of the Proposed Action or the other alternative pumping scenarios. Since these are existing water rights, the BLM has agreed to allow the SNWA to simulate their impact to water resources under the No Action alternative instead. While one can make an argument for simulating the impacts this way, the NPS believes a stronger argument can be made for simulating the impacts under the Proposed Action. If modeled as existing agricultural pumping under the No Action scenario, a portion of this water is presumed to return to (recharge) the aquifer, which has the effect of dampening pumping-related drawdown in Spring Valley. The discussion in lines 26-28 (page 2-4) clearly indicates that “specific development plans for this water would likely occur in the 2018 to 2020 timeframe, based on the current overall project schedule” (emphasis added) which indicates this water is going to be pumped and conveyed out of Spring Valley in the early stages of the project. This planned development and early conveyance of the SNWA’s existing agricultural water rights out of Spring Valley would result in greater drawdown impacts in Spring Valley when compared to the drawdown effects modeled under the No Action scenario, as a result of losing this return flow component to the aquifer. Therefore, the NPS respectfully requests that the BLM require the SNWA to simulate the effect of pumping these existing agricultural water rights under the Proposed Action (and alternatives) to more fully evaluate the pumping-related impacts to water resources in Spring Valley associated with valley water that is targeted for early conveyance in the proposed pipeline.	Comments noted. The rational for including the existing agricultural rights associated with SNWA properties in Spring Valley under No Action are summarized in Section 2.2.2 of the EIS. The combined effect of pumping both the existing agricultural water rights and proposed additional pumping associated with the GWD Project are reflected in the cumulative impact evaluation described in Section 3.3.3 of the EIS.

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ID	Comment	Response
34679-48	With respect to the second bulleted discussion under the subsection titled Pipeline Conveyance Volumes, the NPS is concerned that the pumping impacts related to the LCWD's existing agricultural water rights in Lake Valley are being evaluated as part of the No Action scenario instead of the Proposed Action or the other alternative pumping scenarios. The NPS's concerns are similar to those expressed previously in the comment for page 2-4, lines 24-33. Even though the timing of development plans for these existing water rights are known with less certainty, it's still informative to the public and BLM decision-makers to programmatically evaluate this pumping in the final EIS as part of a worst-case scenario. The NPS respectfully requests that the BLM require the SNWA to simulate the effect of pumping these existing agricultural water rights under the Proposed Action (and alternatives) so that the potential impact can be assessed programmatically in the Tier 1 EIS. This impact can be refined in future subsequent tiered analyses as more definitive information	Comments noted. The rational for including the existing agricultural rights associated with SNWA properties in Spring Valley under No Action are summarized in Section 2.2.2 of the EIS.
34679-49	With respect to the third bulleted discussion under the subsection titled Pipeline Conveyance Volumes, the NPS respectfully requests the BLM to programmatically evaluate the effects of this pumping in this Tier 1 EIS as part of a worst-case scenario, so that the public can start to see what the potential impacts from this pumping might be. While there may be uncertainty as to the timing of pumping and the exact locations and amounts of pumping that might occur, there is ample information as of July 15, 2011 in the NSE's on-line water rights database indicating that LCWD has assumed ownership of water rights applications previously owned by LVVWD, and applied for additional water rights as recently as 2008 in several basins contained in the study area, totaling up to 185,202 afy [Coal Valley (33,071 afy), Garden Valley (23,182 afy), Hamlin Valley (23,182 afy), Patterson Valley(37,671 afy) and Pahroc Valley (68,098 afy)], which one can reasonably infer as likely sources for this additional 21,700 afy of water. The NPS, with help from its groundwater modeling consultant GeoTrans, used the SNWA's previous version of the groundwater model to simulate this pumping scenario using selected points of diversion listed in LCWD's applications in these basins, and submitted the results as part of our administrative review of the DEIS. This proposed LCWD pumping resulted in noticeably more drawdown in the modeled area. Absent a clear indication that LCWD has withdrawn all of these water rights applications, the NPS recommends that the BLM request the SNWA to simulate the effect of pumping this amount of water from these basins as a reasonable foreseeable action associated with the pipeline, so that the potential cumulative impact from LCWD pumping can be assessed programmatically in the Tier 1 EIS. This impact can be refined in future subsequent tiered analyses as more definitive information is submitted by LCWD on its planned pumping. This approach is also consistent with the tiered approach outlined on page 1-5.	Please see standard resource responses Gen-1 and Gen-2.
34679-50	It is the NPS's position that Section 2.1.2 does not show conformance with Secretarial Order 3308 that adds additional direction requiring the BLM to ensure that the components of the NLCS are managed to protect the values for which they were designated, including, where appropriate, prohibiting uses that are in conflict with those values (emphasis added). The NLCS included ACEC's that are likely to be significantly affected by most or all alternatives.	The National Landscape Conservation System (NLCS) units that are the subject of Secretarial Order 3308 would not be directly affected (permanently or physically) by the construction of the SNWA project. The BLM's NLCS was created in 2000 with the mission to "conserve, protect, and restore these nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations." The NLCS includes congressional designations such as National Monuments, National Conservation Area, Wilderness Areas, Wilderness Study Areas, National Wild and Scenic Rivers, National Scenic Trails, National Historic Trails, Cooperative Management and Protection Areas, Forest Reserves, and Outstanding Natural Areas. On the contrary, construction of the SNWA project would occur within ACEC boundaries. However, ACECs are an administrative designation established through a BLM land use plan in accordance with FLPMA Section 202(c)(3) and are not considered part of the NLCS.
34679-51	The NPS requests the BLM disclose in the final EIS that Alternative D is the only action that Congress required the BLM to consider in the LCCRDA.	This is addressed in Section 1.3.1.
34679-52	The last paragraph on page 2-5 speaks to authorities that the BLM has under FLPMA with respect to requests and actions it can take to protect the quantity and quality of natural resources (including water-dependent resources) on BLM-administered lands. Given the BLM's mandate for multiple use on lands it administers, approving actions such as the SNWA groundwater development project (GWD project) often times can conflict with differing resource protection mandates that other federal land management agencies have (e.g., the NPS), where the potential impact from an action could spill over to other federally-owned lands. Please clarify in the final EIS the responsibility or obligation that the BLM may have under FLPMA, NEPA or other applicable regulations in making sure that potential impacts related to approving such actions do not adversely affect or prevent other land management agencies from protecting similar resources on other federally-owned lands (e.g., national park lands, national refuge lands, etc.)	Agencies within the Department of the Interior are responsible for internal communication and coordination to address impacts that would adversely affect or prevent the proper mangement of federally-owned lands. Please see Section 1.2.2 for more information.

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ID	Comment	Response
34679-53	As previously requested in the last administrative draft of the EIS that the NPS reviewed, the BLM has forgotten to include the municipal water right for the Baker General Improvement District in Baker, NV on Figure 2.2-1.	As described in Section 2.2.2 (Groundwater Development for No Action), Figure 2.2-1 illustrates the locations of water supply wells that were included in the No Action Alternative for the purpose of the groundwater modeling simulation. The methodology used to simulate consumptive groundwater use under the No Action pumping scenario is provided in Appendix C of the Transient Model Report (SNWA 2009b). An inventory of active water rights for the hydrologic study area is provided in Appendix F3.3.2, Table F3.3.2-1. As described in Section 3.3.1.7 of the EIS, for Nevada, the water rights inventory includes all active water rights on file with the rights on file with the NDWR at the time the inventory was conducted (July 2008). A review of the active water rights listing provided in Table F3.3.2-1 indicates that this inventory does not include any municipal water right owned by the Baker General Improvement District in Baker, NV. In addition, an updated search of the NDWR water rights data base (http://water.nv.gov/data/permit/) conducted on July 12, 2012 indicates that the water rights database does not include any water rights under the name Baker General Improvement District.
34679-54	In Table 2.3-1 under Special Status Species, number 1, please describe line-of-sight. Is the BLM referring to eagle line-of-sight or human line-of-sight? There is a big difference between the two because Golden Eagles will be using these poles to kill greater sage grouse. As a reference, golden eagles will be within line-of-site with their nest which can range 1km - 5km or greater.	The intent of this Ely District RMP best management practice is to consider raptor line-of-sight as well as topographic and vegetation features that would interrupt line-of-sight between lek and facility. Please also see general comment response WL-2 with regard to greater sage-grouse revisions to the FEIS.
34679-55	In Table 2.3-1 under Special Status Species, number 2, guidelines should come from PacificCorp's Avian Protection Plan, which is retrofitting power lines to protect avian species. PacifiCorp was ordered to pay 10.5 million dollars for killing many golden eagles in 2009 in Wyoming because they failed to use proper protection. The E.A. or E.I.S (not sure which) indicated that there weren't a lot of eagles there but once the power poles were installed, it gave them a perch to hunt from – causing many more eagles to use them and die from them. PacificCorp stopped using bird deterrents throughout the west because they don't deter. Instead they started changing the protection on their equipment – covering insulators, arrestors, etc., and changing the length of the power line arms. Now when they put up new power lines, they install the proper protection right away because it's cheaper and safer for the linesmen.	Please refer to standard resource response WL-1 for information on this topic.
34679-56	In the first bullet sentence (line 16) under subsection 2.3.2.1, the NPS recommends that you revise this sentence to read, "Establish a system of early-warning monitoring wells with the Spring Valley and Hamlin Valley hydrologic basins, in both the alluvial and carbonate aquifers;" (italicized text denotes suggested revised language). Additionally, the NPS respectfully requests revising the last bullet sentence (line 22) in this same subsection to read, "Groundwater withdrawal by the SNWA shall not affect Federal Resources within the boundaries of GBNP."	Revisions to the text were made as suggested.
34679-57	The NPS respectfully requests the BLM disclose that there is no Snake Valley stipulated agreement at this point, that there is no draft 3M Plan that any federal agency has agreed to, and that pending both an interstate agreement and hearing by the NSE, along with a future Tier 2 EIS for specific pumping locations, all of the text in this section is speculative.	Thank you for your comment. Please see Standard Resource Response MM-1.
34679-58	The discussion in lines 26-38 (fourth paragraph) focuses on the anticipated water usage that is needed for pipeline construction activities. It is estimated that between 5.5 and 8.7 million gallons of construction water would be needed for every mile of pipeline, with less needed for dust suppression. This estimate equates to about 5,165 to 8,170 acre-feet of water over the construction life of the main pipeline. Was this pumping factored into the groundwater modeling simulations? If not, the BLM should give consideration to requiring the SNWA to incorporate this pumping into the programmatic impact analysis for this Tier 1 EIS.	Construction water supply requirements are discussed and evaluated for each alternative. For example, see Section 3.3.2.2 under the heading "Construction Water Supply" and mitigation measures ROW-WR-3 Construction Water Supply Plan.

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ID	Comment	Response
34679-59	Based on the information presented in the timeline (Figure 2.5-6), why is construction the Snake Valley lateral pipeline being allowed before a Snake Valley water rights hearing is convened and 25 years before any groundwater is needed? As stated in the NPS's previous comment for page 1-6 (related to the discussion in Section 1.3.4), specifically the first bulleted concern, if the BLM were to allow construction to occur before a Snake Valley water rights hearing is convened, this could unduly influence the NSE's decision on the SNWA's applications in Snake Valley. It would also unduly interfere with the ability of protestants of these applications, including DOI bureaus, to protect resources and their existing water rights in Snake Valley. Conversely, a requirement to withhold issuance of any ROW and/or Notice to Proceed would protect the SNWA and rate payers from expending considerable amounts of money to construct the pipeline lateral into Snake Valley until the water rights applications are resolved by the State of Nevada. Since the Snake Valley lateral pipeline would not be needed for more than 25 years, which is the current projection presented in Figure 2.5-6, the Snake Valley pipeline should not be approved as part of the proposed Project. The NPS respectfully requests that discussion of this pre-condition be included in the final EIS, and that Figure 2.5-6 be modified to reflect the earliest probable Snake Valley water rights hearing date and a timeframe for constructing a potential Snake Valley lateral pipeline that occurs after this water rights hearing. As noted in our earlier comment for page 1-6, based on the still unresolved Nevada-Utah water allocation agreement and the probable condition specifying the NSE will not schedule a Snake Valley water rights hearing for a period of 10 years after the agreement has been signed and executed, the earliest one can probably envision a Snake Valley water rights hearing is 2022-23, and the earliest one can probably envision the Snake Valley lateral pipeline construction to begin is 2023-24.	Neither the FEIS nor the ROD grant permission to construct the Snake Valley Lateral. The analysis in this FEIS provides the basis for subsequent NEPA tiering. Future ROWs, pipelines, power lines, wells, and roads will be approved or denied through decision documents prepared through the NEPA process for additional phases of the groundwater development project. Figure 2.5-6 reflects a potential timeline that includes the programmatic analysis of the project.
34679-60	Additionally, as stated in the NPS's previous comment for page 1-6 (related to the discussion in Section 1.3.4), specifically the second bulleted concern, if pumping-related impacts cannot be fully evaluated until future tiered EIS analyses (Tier 2) are completed, then the potential flaw in the current tiering approach is that a Tier 2 analysis may conclude that effects of pumping (e.g., in Snake Valley) are locally significant and cannot be mitigated effectively. Under this scenario, there is risk that the Tier 1 review may lead to a ROW approval, followed by a Tier 2 analysis that might conclude such approval is in error. Examination of the project timeline presented in Figure 2.5-6 shows that Tier 2 NEPA analyses will be completed half way through the construction of the Cave Valley lateral pipeline, approximately 5 to 22 years after the completion of the Spring Valley lateral pipeline, and 24 years after the completion of the Snake Valley lateral pipeline. The NPS respectfully requests that the decision to grant a ROW be withheld until the degree and magnitude of all related environmental impacts are fully understood following the completion of future tiered EIS analyses. Section 1.3.4 of the final EIS should more clearly articulate that any decision to grant ROW is contingent on completion of subsequent environmental analyses in future tiered analyses. The NPS also requests that Figure 2.5-6 be revised to address this concern and illustrate that Tier 2 NEPA analyses must be completed before construction of a pipeline segment is allowed.	In response to your comment, Chapter 1 has been revised.
34679-61	The NPS respectfully requests the BLM disclose in the discussion related to Figure 2.5-6 that any action authorized by this EIS will need to undergo a sufficiency analysis after 5-10 years and that any action approved by a BLM ROD that is not acted upon in that will likely require a new or revised EIS.	In response to your comment, text has been clarified.

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ID	Comment	Response
34679-62	The discussion in the last paragraph on page 2-33 (lines 21-25) indicates groundwater pumping under the Proposed Action would be spatially distributed within the project basins, which could help to minimize the pumping effects on senior water rights and on areas that contain sensitive or listed species and their associated groundwater-related habitat. Similar language is used later in Chapter 2 in the discussion about Alternative A. What evidence does the BLM have on which to base these statements? Examination of the results for the Proposed Action and Alternative B in Tables 2.10-3 and 2.10-4 of the DEIS for Water and other water-dependent resources (e.g., Vegetation, Aquatic Biologic, Soil) suggests evidence to the contrary. These two actions pump the same amount of water (176,655 afy), but differ from each other in that dispersed pumping at many points of diversion is modeled under the Proposed Action, while focused pumping occurring at fewer discrete points of diversion (PODs) listed in the SNWA's water rights applications are modeled under Alternative B. Results in these two tables indicate that with few exceptions, dispersed pumping under the Proposed Action will result in an increased number of surface water and groundwater rights being affected, and an increase in the percent reduction in groundwater discharge to evapotranspiration (ET) in Spring Valley, Snake Valley and the Great Salt Lake Desert Flow System, when compared to the same results for Alternative B. This potentially translates into greater effects on senior water rights, and on areas that might contain sensitive or listed species (e.g., streams and springs) and their associated groundwater dependent habitat (e.g., areas with phreatophytic or high-ET vegetation). Similar results are suggested in Tables 2.10-3 and 2.10-4 when comparing Alternative D to Alternative E. These two alternatives pump the same amount of water (78,755 afy) from the Spring and CDD valleys, with the difference being distributed pumping is concentrated in southern Spring Valley under Alternative D, while distributed pumping is scattered throughout Spring Valley under Alternative E. The comparative results for these actions and alternatives suggests that dispersed pumping alone may have the negative trade-off of actually increasing certain impacts to water resources and associated water-dependent resources. The NPS respectfully requests the BLM revise the discussion in the last paragraph on this page to be less definitive of the merits of distributive pumping in light of the results presented in Tables 2.10-3 and 2.10-4, and to address these observations in more detail in the discussions presented in Section 3.3.2 and how these observations relate to evaluating the potential effectiveness of the proposed mitigation measures.	The alternatives are presented as a means for the public to compare potential impacts. It is acknowledged that the impacts will differ by alternative. The differences between alternative impacts has helped the BLM determine its choice of a preferred
34679-63	The NPS respectfully requests deleting the word "entire" in the first sentence and replacing it with the word "preliminary." As the BLM stated in Chapter 1, a programmatic analysis is being conducted for future groundwater pumping operations and facilities, because the precise nature, extent, or location of water-related effects cannot be determined at this time to conduct a more detailed NEPA analysis. Therefore, the BLM is unable to consider the "entire" effect at this time, because they have admitted there is incomplete information to do so. The entire effects will be known once all Tier 2 NEPA analyses have been completed.	The word "entire" has been removed but not replaced. The qualifer is not a necessary component of the sentence.
34679-64	The NPS respectfully requests that the BLM to revise the second sentence (lines 4 & 5) under subsection 2.5.2.6 (Abandonment) to read: "In accordance with the LCCRDA and the SNPLMA, the ROW in Clark and Lincoln counties is granted in perpetuity." (italicized text denotes suggested revised language). It is our understanding that these two acts of Congress only mandate the authorization of the pipeline ROW in these two counties, and that the BLM has discretion under the FLPMA whether or not to grant pipeline ROWs in White Pine County; there is no Congressional mandate to do so.	Text has been revised pursuant to your comment.
34679-65	The NPS respectfully requests the BLM to revise the first bulleted sentence under subsection 2.5.3.1 (Applicant-committed Environmental Protection Measures) to read "SNWA will obtain necessary permits and approvals, including water rights permits, and complete all necessary Tier 2 NEPA analyses prior to commencing construction." (italicized text denotes suggested revised language). The NPS's reasoning for this suggested change was presented in previous comments for page 1-6.	Changes have been made in the FEIS text to address the central concern that underlies this comment; however, due to its overarching nature, specifics regarding the placement of changes in the FEIS are not provided in this response.
34679-66	The first paragraph on page 2-48 has been split apart at lines 8 and 9, and should to be rejoined.	Thank you for your comment.
34679-67	Please check the table citations presented in the third and fourth bulleted items (lines 29-31) under the discussion about how Alternative A differs from the Proposed Action. These citations seem to be incorrect or are referencing information in tables that don't appear to contain the information being discussed.	Table citations have been corrected.
34679-68	Table 2.6-1 seems to be incorrectly cited in the second paragraph (line 28) under Section 2.6.2. Numbers of wells are presented in Table 2.6-2 and not Table 2.6-1. Please check this citation and correct if appropriate.	Thank you for your comment. The correct table citation should be Table 2.6-7.
34679-69	The NPS recommends that the BLM provide a similar table under the other discussions in Section 2.6 about the Proposed Action and the other alternatives. This table is very useful in aiding the reader to understand the projected construction schedule and milestones for each action.	Every alternative analyzed in section 2.6 references a table that compares the alternative to the Proposed Action. Tables and figures are also referenced for clarifying the construction milestones and estimated construction workforce.

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ID	Comment	Response
34679-70	The NPS respectfully requests the BLM revise the first sentence (line 15) under subsection 2.6.4.8 (Conceptual Future Facilities) to read: “Alternative D would include development of a reduced quantity of the SNWA water rights application volumes in Cave, Dry Lake, Delamar, and Spring valleys.” The current sentence refers to existing water rights the SNWA has in these valleys, which is a misstatement considering the Nevada Supreme Court’s decision to vacate these rights and return them to application status in 2010. Please revise an identical statement made in the first sentence of subsection 2.6.5.8 (page 2-75) concerning Alternative E.	The sentence refers to the SNWA "application volumes" and therefore, is correct as written. No change.
34679-71	Please remove the reference to Figure 2.6-11 in line 1, as there is no information presented in this figure pertaining to the final size of the main and lateral pipelines.	Thank you for your comment. The reference to figure 2.6-11 has been removed from the text.
34679-72	The first sentence (lines 15 & 16) under subsection 2.6.5.6 (Construction Schedule) is in reference to the construction milestones presented in Table 2.6-19 and states that the anticipated construction schedule would be the same as described for the Proposed Action, excluding the Snake Valley Lateral and associated facilities. When these construction milestones are compared to the Project Timeline presented in Figure 2.5-6, there are several differences in the projected construction start and finish timeframes for several of the project components. For example, the table indicates construction of the Cave Valley Lateral will be started and completed in 2017, but Figure 2.5-6 shows it starting in 2015-16 and completing in the 2017-18 timeframe. Additionally, the Spring Valley Lateral is not accounted for in Table 2.6-19. Please make sure the construction start and finish timeframes in Table 2.6-19 and Figure 2.5-6 are consistent with each other as this is confusing to the reader. Please conduct a similar check of Table 2.6-13 (page 2-63) and make sure the same start-finish timeframes in this table is consistent with Figure 2.5-6.	Discrepancies regarding construction schedules have been corrected in the FEIS. Spring Valley North and South laterals have been added to Table 2.6-19 but do not apply to Table 2.6-13.
34679-73	The NPS respectfully requests the BLM to revise the second sentence (lines 17 and 18) in the second paragraph of the subsection titled Conceptual Groundwater Development Plan to read: “This volume assumes the development of a portion of the pending SNWA water rights applications in Spring, Cave, Dry Lake and Delamar valleys (Table 2.1-2).” (italicized text denotes suggested revised language). See the NPS’s comment for page 2-64, line 15 for the reasoning of this change.	Text has been revised based on NSE rulings.
34679-74	Great Basin National Park is not identified in either of the 2 maps shown. There are 52 omissions of the park on maps used in the document. Several omissions are critical to providing the correct information. (See: Figures: 3.7-3, 3.8-2, 3.8-5, 3.19-1) In Figure 3.7-2 there is no longer a National Forest boundary with the park.	There are no USFS lands shown on Figure 3.7-2 as indicated in this comment. Great Basin National Park is now shown on most maps in Chapter 2. Due to the complexity and scale of these maps, the park is not added to most of the maps in Chapter 3. The boundaries of GBNP has been added to Figures 3.7-3 and 3.7-4.
34679-75	Figure 2.9-1 and the discussion in section 2.9.1.2 fail to disclose either the Hamlin Valley Wind Park, or the TransWest Express Transmission Project, both of which meet all of the BLM criteria for analysis.	The Hamliin Valley Wind Park is currently not considered a project by the BLM as they have not yet received a Plan of Development. The TransWest Express Transmission Project will be added to Section 2.9.1.2 as a reasonably foreseeable future action.
34679-76	Please elaborate on what is meant by “formal development plans submitted to regulatory agencies for permitting purposes” which is stated in the last criterion (lines 35 and 36) under subsection 2.9.1.3 (Groundwater Development). The NPS respectfully requests that formal development plans be expanded to include any proposed groundwater development actions that have initiated a formal water right hearing in Nevada or Utah. The NPS believes that initiating a water rights hearing is as strong of a good-faith indicator as is initiating a NEPA review process. In its earlier administrative review of the DEIS, the NPS requested including a couple of proposed groundwater development projects that have initiated water rights hearings as reasonably foreseeable future actions under this EIS. These projects included the SNWA’s proposed groundwater development in Coyote Spring Valley (27,500 afy) and the Central Iron County Water Conservancy District’s proposed groundwater development project in Hamlin, Pine, and Wah Wah counties (Utah) near the western border of Utah. Both of these projects have gone to a water rights hearing which indicates a strong interest by these parties at developing groundwater from these basins, and yet, these proposed projects are omitted from consideration with respect to evaluating cumulative effects. As a result, we believe the DEIS does not fully evaluate the potential cumulative impacts associated with the proposed action or the alternative actions.	It has been BLM’s experience that water rights under application and granted through hearings do not assure a water development project. There are various areas where water rights have been issued and no project was ever developed. As example, White Pine County had water rights for the development of potential power plants in Spring Valley and Steptoe Valley. The Nevada finally issued a ruling releasing the water rights in Spring Valley but those rights still exist in Steptoe Valley. Power plants have been proposed but at this time no approvals or projects remain. BLM’s Handbook H-1790-1 states that “Reasonable foreseeable future actions are those for which there are existing decision, funding, formal proposals, or which are highly probable, based on known opportunities or trends.” Based on the speculation of future housing and water needs, the projects mentioned in this comment are not reasonably foreseeable at this time but maybe considered in future tiered NEPA.
34679-77	Please explain why the Lincoln County Water District / Vidler Water Co. groundwater project in Clover Valley is included as a reasonably foreseeable future groundwater development project when the water rights status of this project is the only one listed in the table as “Application.”	Cumulative impact evaluations for groundwater development include groundwater developments that may occur in the future associated with proposed projects that have submitted formal development plans to regulatory agencies for permitting purposes.
34679-78	The NPS respectfully requests that the BLM revise the last sentence (lines 5 and 6) to read: “Based on these estimates, the GWD Project would be the primary groundwater user in all five groundwater development basins proposed for pumping, and in the water resource region of study in the EIS.” (italicized text denotes suggested revised language). The suggested language change is consistent with the discussion on cumulative effects in this section and is based on the NPS’s observation that the volume of water developed under the Proposed Action represents the largest percent contribution (54%) to the total groundwater production in the study area represented in Table 2.9-5. This observation is also valid for Alternative B (54% of total) and Alternative A (43% of total).	Modified text as recommended.

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ID	Comment	Response
34679-79	The references to Tables 2.10-2 and 2.10-3 are incorrectly cited and should be corrected to Tables 2.10-3 and 2.10-4, respectively Additionally, the BLM should insert language into this discussion that correctly describes the contents of Table 2.10-2, which appears to summarize future groundwater development impacts associated with surface disturbance for the proposed GWD Project.	References to tables were corrected as recommended. Text to describe Table 2.10-2 was inserted.
34679-80	The NPS commends the BLM for summarizing the study results in Tables 2.10-3 and 2.10-4. These tables greatly aid the reader's ability to fully understand the extent and degree of impact posed by the GWD project to the various resources of concern that were evaluated under this EIS. Do the results in Tables 2.10-3 and 2.10-4 represent a summary of the incremental or cumulative impacts associated with groundwater pumping? The title in both tables should be revised to indicate if it is the former or the latter. Additionally, why did the BLM choose not to include a full set of groundwater pumping impact results (incremental and cumulative impacts) for the reader to review? Since NEPA requires the evaluation of incremental and cumulative impacts from the GWD Project, the NPS respectfully requests the BLM to provide a full set of results so that the reader can begin to compare the incremental effects against the cumulative effects in order to gage the full range of impact posed by the GWD project.	Tables 2.10-3 and 2.10-4 represent a summary of the incremental impacts associated with groundwater pumping. The table titles have been changed to make this clear to the reader. Within the Cumulative Impacts subsection of every resource section there is a figure and accompanying text that quantifies the difference between the incremental and cumulative impacts associated with groundwater pumping.
34679-81	The third bulleted item on page 3-7 (lines 20-24) discusses the BLM's approach to evaluating proposed mitigation and mitigation effectiveness, as well as the documentation of this approach. Are the results of the BLM's effectiveness review process provided or discussed in more detail elsewhere in the draft EIS? In an earlier NPS comment (see comment for page 2-33, lines 21-25), the NPS provided an example where the BLM's claim of the potential effectiveness of a proposed mitigation measure (i.e., dispersed pumping) to minimize the pumping effects on senior water rights and on areas that contain sensitive or listed species and their associated groundwater-related habitat, appears to be unsubstantiated by results presented in the draft EIS. This example suggests that the BLM has not thoroughly evaluated the potential effectiveness of this mitigation measure and possibly other mitigation measures that are being proposed in the draft EIS. The NPS believes this is a deficiency in the draft EIS that needs improvement in the final EIS. In comments submitted by the NPS as a cooperating agency during administrative reviews of the draft EIS, the NPS urged the BLM to conduct a comparative study of the results generated from the groundwater modeling simulations for the Proposed Action and the various alternative actions as a means to preliminarily evaluate and discuss the likely effectiveness of some of the mitigation measures proposed under the GWD Project. Specifically, the groundwater modeling simulation results presented in the draft EIS could be used to evaluate the potential effectiveness of dispersed pumping (compare Proposed Action to Alternative B), reduction or cessation of pumping (compare Proposed Action to Alternative A), and to some degree a combination of both of these measures (compare Alternative B to Alternatives A and C). The time to fully evaluate the effectiveness of these and other mitigation measures is before ROWs are granted, and pipelines and wells are constructed, especially if the comparative evaluation indicates some of these measures will likely be ineffective at minimizing or avoiding impacts in some of the basins. The NPS respectfully requests the BLM to revisit this issue and discuss it more fully in the final EIS.	Thank you for your comment. Please see Standard Resource Response MM-1.
34679-82	The last sub-bulleted discussion (lines 39-46) at the bottom of page 3-9 talks about other resource connections to groundwater where drawdown effects were evaluated. There are several resource categories that are not identified in this discussion, but are depicted on Figure 3.0.2 (page 3-10) as having a direct or indirect connection or linkage with drawdown effects. These resources include Recreation, Visual Resources, and Socioeconomics and Environmental Justice. Please include these resource categories in the discussion in lines 39-46. Additionally, the discussion does recognize Geology (mainly effects on caves and land subsidence) being evaluated, but this resource category is not represented in Figure 3.0.2. Please correct this omission in the figure. The NPS also recommends revising the figure to include another Connection to Groundwater category along with a couple of associated Resource Linkages to address drawdown effects to groundwater usage in the study area. The NPS recommends including a new connection to groundwater category titled "Identify Groundwater Use Areas" accompanied by two resource linkages: "Groundwater Sources (or Supply?)" and "Other Resource Connections to Groundwater." The "Groundwater Sources" linkage would be similar to the existing Surface Water Sources linkage in that other affected resources relying on groundwater as a direct supply or source (e.g. Socioeconomics, Livestock, Wildlife?, Wild Horses?, etc.) are accounted. This category and linkage is directly pertinent to the BLM's evaluation of impacts to groundwater rights and uses, which are likely tied into these affected resources. The "Other Resource Connections to Groundwater" linkage could be a catch-all linkage that could include Geology as a resource affected from direct groundwater use. Another option might be to roll the existing Identify Phreatophytic Vegetation with Connection to Groundwater category in with the newly proposed "Identify Groundwater Use Areas" category and treat phreatophytic vegetation as a third resource linkage to Groundwater Use Areas, since impacts to phreatophytic vegetation will come from the direct result of groundwater usage.	The suggested text was added to page 3-9. The figure was revised to include the direct use of groundwater resources.

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ID	Comment	Response
34679-83	The NPS would like to suggest a couple of editorial changes to consider for Figure 3.0.2. The NPS suggests changing the title Resources along the left margin of the figure to Affected Resources. The NPS also suggests changing the resource linkage category titled Vegetation & Habitat to Riparian Vegetation & Habitat, since this linkage seems to include riparian-style vegetation that might be expected in and around springs or streams. This would further differentiate this vegetation from phreatophytic vegetation.	The first requested change is redundant with the title of the Figure. No change. The second requested change is unnecessary as phreatophytic vegetation is called out separately. No change.
34679-84	In the discussion presented in the subsection titled Impacts on Productivity and Commitment of Resources, which extends from page 3-12 to 3-13, please define “long-term productivity,” as this is currently missing from the discussion. The discussion mentions the short-term use of the environment relative to the long-term productivity discussed for each resource. The BLM defines short-term uses and long-term impacts, but not long-term productivity. Long-term productivity conveys the ability of a resource to maintain a stable level of production, whereas an impact (short-term or long-term) conveys a disruption in the resource stability.	Long-term productivity was defined.
34679-85	The NPS respectfully requests the BLM update Figure 3.1-1 so that the precipitation data presented run through 2010.	It is difficult to continually update data over the duration of a long NEPA analysis. The most current data was used at the beginning of the NEPA analysis. Since it is not expected that adding four years of data would change the understanding of the current climatology or result in changes to the analysis, it was determined that extending the dataset was not warrented. Thank you for your comment, it was considered carefully.
34679-86	This section (3.1.2.2) along with others talks about dust control plans and surface disturbance plans, and although several appreciated dust control measures are being committed to for the entire project, the NPS continues to recommend that the same dust control plan be developed and implemented project-wide during construction that would be approvable by both Clark County and the state of Nevada.	The BLM does not have the authority to require that the dust control plan developed for Clark County be implemented throughout the project area; however, the BLM must review and approve of the proponent's dust control measures prior to issuing a notice to proceed.
34679-87	The NPS appreciates your recommendation for a monitoring, mitigation, and management plan for air quality and associated additional ambient monitoring. We realize with the uncertainty as to the effects of groundwater drawdown that impacts of the project might not be totally mitigated. However, it is important that the identification of any problem is most timely and that the actions to be taken are consistent with the nature and extent of that problem with the goal of minimizing air quality degradation in National Park Service areas. We continue to want to work closely with the BLM and the proponent when the time comes to develop and implement this plan, including addressing questions like monitor placement and selection of adaptive management strategies.	Please see standard resource responses Air-13, MM-1 and MM-2.
34679-88	This section does not disclose the cumulative impacts of ANY of the RFFAs. It completely ignores the potential impacts of 155,967 acres of future development within the project area. As a specific example, on page 145 of the recently released EA for Spring Valley Wind discloses that “fugitive dust from disturbed soils would be a major source of particulate emissions” (emphasis added). This draft EIS does not disclose nor quantify the cumulative impact that the Spring Valley Wind project or any of the other RFFAs will have on fugitive dust, total new miles of unpaved roads, or any other cumulative impact issue.	Please see common response Air-20.
34679-89	Figure 3.2-4 showing the extent of karst features in the project area relies on an older map (one the National Atlas copied) that is currently being redone. It severely underestimates the karst features in Great Basin National Park (which should be shown on this figure). The NPS respectfully recommends that the BLM use the state geologic maps for Nevada and Utah to disclose the full amount of karstic carbonate rock and thus the true extent of potential impacts to cave resources.	A national karst map is being redone by the USGS, but as far as could be determined, it has not been released. Therefore, the data in the National Atlas, based on Engineering Aspects of Karst by Davies et. al (1984) is the best available data at this time. No changes were made to the document or exhibits because of this comment.
34679-90	The NPS suggests that the following two statements on page 3.3-21 under the discussions about Caves conflict with each other: “Also, the caves themselves constitute unique geological features that are potentially at risk. However, there are other concerns related to caves with regard to groundwater hydrology, wildlife, and cultural resources.” (lines 18 & 19) ’ vs ‘ “Data do not exist to provide a connection of area caves to groundwater; therefore, caves are not anticipated to be affected by groundwater pumping.” (line 35 & 36)	Potential impacts to caves from drawdown are more appropriately addressed in Section 3.3.2.8, Water Resources Groundwater Development and Pumping and Section 3.6.2.8, Terrestrial Wildlife Groundwater Development and Pumping. A statement referring the reader to these sections has been inserted under the Issues heading in Section 3.2.2.8 and references to caves have been deleted from the groundwater pumping headings under Section 3.2.2.8.
34679-91	Furthermore, the latter statement is not consistent with information on pages 3.3-18 to 3.3-20, regarding what is currently known regarding the hydrologic setting of the Baker Creek Cave System in Snake Valley. The NPS suggests that the above statement be modified as follows: “More information is needed to determine the degree of connection, if any, of caves within the study area to aquifers from which groundwater pumping is proposed. Much uncertainty still exists at many locations within the study area. In some settings and locations within the study area, available evidence indicates that water resources in caves are not likely to be directly affected adversely by groundwater pumping in adjacent valleys. In other settings and locations, available evidence indicates that hydrologic connectivity with aquifers in adjacent valleys from which groundwater pumping is proposed is likely, and thus water resources in caves likely will be adversely affected by the proposed action.”	Please see response to comment #90 above.

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ID	Comment	Response
34679-92	Data do exist that indicate that a connection of at least some area caves in the Baker Creek Cave System and groundwater is likely. The BLM is required to disclose that respected scientists have made this connection [e.g., Lange (1954)]. At the very least, this section needs to refer to the more detailed discussion on pages 3.3-18 to 3.3-20.	Please see response to comment #90 above.
34679-93	This discussion of caves does not give a fair and balanced accounting of the conclusions reached by Prudic and Glancy (2009). Elliott, Beck, and Prudic (2006) concluded that Cave Springs were within an area that generally was “likely susceptible” to groundwater pumping in adjacent valleys. Prudic and Glancy (2009) did a site-specific investigation of the Cave Springs area, and concluded that this spring area is less likely to be susceptible than originally thought. Prudic and Glancy (2009) state (pg 26) that “… the potential for spring depletion from ground-water pumping in Snake Valley is less than if carbonate rocks were present beneath the springs…” These springs are located near the edge of the area that Elliott, Beck, and Prudic (2006) delineated as “likely susceptible.” This is NOT an upland spring area. It is neither fair nor balanced to state that it “may not be linked hydrogeologically with aquifers that would be pumped in Snake Valley”, as stated in this section. It is just less susceptible than originally thought. In fact, in numerical groundwater flow model simulations by the USGS (Halford and Plume, 2011), simulation of groundwater pumping similar to EIS Alternative B caused approximately 10% decline in the discharge of Cave Springs, which, although notable, is much less than the simulated depletion at Rowland Spring in this simulation. This result is consistent with the conclusions of Prudic and Glancy (2009). Rowland Spring is “likely susceptible” and Cave Springs is less susceptible than that. The incorrect conclusion was drawn and stated in this section. Furthermore, the followup statement that: “The research by Prudic and Glancy (2009) indicates that caves and cave systems in mountain ranges may also be similarly sourced and not subject to drawdown effects” is not true, is biased, and should be deleted. The Prudic and Glancy (2009) study was solely about Cave Springs and the geologic, hydrologic, and geochemical evidence determined at this setting. The conclusions that were reached were specific to that location. Transfer of these conclusions to other locations is inappropriate, and an assessment would need to be based on the geologic, hydrologic, and geochemical evidence at those locations.	Please see response to comment #90 above.
34679-94	Section 3.2 repeatedly concludes, “Insufficient hydrogeologic data exist to estimate drawdown effects to cave water resources.” This draft EIS conclusion is not necessarily correct at all locations. The NPS disagrees with this repeated conclusion at the area of Model Cave and Squirrel Springs Cave, where available evidence indicates that the caves that are in contact with the water table , and thus the water resources within the caves likely are hydraulically continuous with local aquifers. In these cases, one of the numerical groundwater flow models of the area can be used to estimate drawdown at these locations. The estimated drawdown in these caves will likely be similar to the estimated drawdown for the identified areas. That is, if the model shows a 10 foot drawdown for the area in which the cave is located, the water level in the cave likely will go down 10 feet; if the drawdown is 50 feet, the water level in the cave likely will go down 50 feet.	Please see response to comment #90 above.
34679-95	Tables 3.2-19 and 3.2-21 summarize the amount of square miles that would be impacted by subsidence greater than 5 feet. Discussion in a paragraph on page 3.2-52 mentions that this subsidence “could damage roadways and structures.” The NPS respectfully requests that additional information be provided in the final EIS about the number of structures and miles of roads that could be impacted, as well as the cost of these damages. If roads and structures are damaged due to the groundwater pumping, who will pay? This needs to be clearly spelled out in the discussion about mitigation of subsidence impacts.	Potential impacts related to groundwater pumping have been addressed at a programmatic level in this EIS. Subsequent NEPA will be required to determine and disclose site-specific impacts.
34679-96	Regarding the first sentence of the first full paragraph on this page: thank you for acknowledging that the hydrologic study area does not include the entire Great Salt Lake Desert flow system.	Comment noted.
34679-97	In the first sentence of the second full paragraph, it is stated that both the White River and Meadow Valley Wash flow systems are tributary to the Colorado River regional flow system and that both are included in their entirety in the study area. This is correct, but the NPS recommends that it be noted that the Virgin River flow system is also tributary to the Colorado River regional flow system and that no part of this flow system, not even the lower Virgin River flow system that includes the Tule Desert (HA 221) and Lower Virgin Valley (HA 222), has been included in the study area.	This subsection was intended to provide a brief overview of the regional flow systems included within the study area. As stated in the comment, the Virgin River is not included in the study area and therefore, not relevant to the description.
34679-98	In the last sentence of the second full paragraph on this page, it is stated that: “Subsurface outflow from the White River flow system is toward the south, into Lake Mead (SNWA, 2009a).” This statement is false. All available evidence indicates that the subsurface outflow from the White River flow system occurs at the Muddy River Springs and Rogers and Blue Point Springs, and little if any groundwater discharges directly into Lake Mead. This is supported by geologic evidence (Ransom, 1920’s, Longwell, 1930’s), Page and others, 2006 and 2011), hydrologic evidence (Prudic and others 1995), and water rights information (NDWR [Coache], written communication). The fact that the discharge of the Muddy River Springs and Rogers and Blue Point Springs has not declined in correspondence with the approximately 100 foot decline in Lake Mead pool elevation over the time period of approximately 2000- 2010 is further evidence for their lack of hydraulic connection. The NPS suggests that this sentence state: “The majority of subsurface outflow from the White River flow system occurs at the Muddy River Springs and likely at Rogers and Blue Point Springs. Available evidence indicates that little if any subsurface outflow from the White River flow system occurs directly to Lake Mead.”	The last sentence was removed.

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ID	Comment	Response
34679-99	The discussion regarding conceptual groundwater flow here is quite good. The reference to Welch et al. 2007) on page 3.3-4 is quite apropos, especially the statement that: “Within intermediate systems, springs typically discharge near the intersection of the alluvial fan and the valley floor near the range front.” This is likely the principal reason for Big Springs and other nearby springs in southern Snake Valley. The NPS brings this up here because this discussion and the citations of the USGS do not mention range-front faulting as the principal controlling factor in groundwater flow systems. This is in contrast to the importance placed on faults as a factor upon which the CCRP numerical groundwater flow model was developed. Although faulting can be an important factor in some instances, the lack of focus of the discussion on faulting in citations from the USGS in this section speaks volumes about its overall importance on flow systems. The NPS respectfully recommends that in subsequent sections on the effects of faulting, this USGS conceptualization be given more weight.	Please refer to standard resource response WR-3.
34679-100	In the first line of the fifth paragraph under subsection 3.3.1.4, please insert the word “areas” after the word “exploratory”.	Text changed as suggested in the comment.
34679-101	The fourth sentence states that: “The discharge locations for most of these springs are assumed to be controlled by an inferred northnorthwest trending fault.” This likely is indeed a factor in the local-scale determination of the exact location of these springs, but on a regional scale, the principal controlling factor in the location of the Fish Springs most likely is that regional groundwater flow in the Great Salt Lake Desert flow system that is moving generally northeastward encounters low permeability salt deposits associated with the Great Salt Lake Desert saltpan, and thus cannot continue to move northeastward any further as groundwater. Given that this water likely has enough hydraulic head, it comes up to the surface as springs.	Please refer to standard resource response WR-18.
34679-102	In the third paragraph under the minor subsection titled White River Regional Flow System, the paragraph begins with a discussion about the Muddy River Springs and ends with a discussion about Rogers and Blue Point springs in Lake Mead NRA. Please put the discussion about Rogers and Blue Point springs into a separate paragraph, as these springs are believed to represent the terminal discharge of groundwater from this portion of the regional carbonate-rock aquifer and deserve separate recognition from the Muddy River Springs.	Thank you for your comment. The text was changed as suggested in your comment.
34679-103	All of the springs presented in Table 3.3.1-4 (page 3.3-16) are presented on Figure 3.3.1-4 with the exception of Willard Spring, Layton Spring and Swallow Spring. Please correct the map so that these three springs are also included, so that the reader knows where they are located in relation to the other springs that are being discussed for Spring Valley. Additionally, all of the springs contained in Table 3.3.1-4 are discussed with the exception of Willard Spring. Please be consistent and provide appropriate discussion for Willard Spring in the final EIS, since the BLM has identified it as one of the ten springs to be discussed for Spring Valley.	The location for Willard Spring was shown and labeled on Figure 3.3.1.4 in the DEIS. A brief description of the spring was added to the text of the FEIS. The location of Layton Spring and Swallow Springs were added to Figure 3.3.1. 4 in the FEIS.
34679-104	Discussion in sections 3.3.1.4 and 3.3.1.5 about the possible interconnection of surface water and groundwater within the study region is largely absent and/or speculative for this Tier 1 EIS analysis. As noted in subsection 3.3.2.8 (Groundwater Development Areas and Groundwater Pumping [Subsequent NEPA Tiers]), a couple of issues of environmental consequence are closely related to understanding the potential for stream base flow reduction resulting from groundwater drawdown. Aside from the reference and discussion to the Elliott et al. (2007) study in GBNP, little has been mentioned about the availability or intent of collecting synoptic stream discharge data, which are minimally necessary to adequately address this issue.	Section 3.3.1.4 and 3.3.1.5 are intended to provide an overview of the surface water and groundwater resources across this large (approx. 20,000 sq. mi.) study area. Synoptic stream flow data is very limited across this region. Stream flow data provided in Elliot et al for selected streams located within and near GBNP is briefly summarized and more detailed information (including the synoptic streamflow measurements) is provided in the referenced document. In addition, the synoptic stream flow measurements combined with the geologic interpretations provided in Elliot et at were used to define the surface water susceptibility zones provided in Section 3.3.2.8 under the heading "Identification of Springs and Streams Susceptible to Drawdown Impacts within Great Basin National Park" and illustrated in Figure 3.3.2-1. The interested reader is referred to the Elliot et. al report for site specific data and analysis (including the synoptic stream flow measurement data sets and methodology) used to define the susceptibility zones.
34679-105	If it is BLM’s intent to have the applicant address this deficiency during subsequent NEPA tiers, then the NPS respectfully requests that additional language be included in this Tier 1 EIS clearly stating that the granting of a pipeline ROW into any basin at this stage of the NEPA process will be partially conditional upon the applicant collecting site-specific information and demonstrating in subsequent NEPA tier analyses the magnitude and extent of this possible interconnection and the resulting stream base flow reductions that are likely to occur. Given the BLM’s admission in the draft EIS that insufficient information exists to definitively address this and many other pumping-related impact concerns at this stage of the NEPA process, the NPS believes it is imprudent for BLM to grant ROWs at this stage that allow construction of the pipeline to proceed, until all subsequent NEPA tier analyses have been completed and it is shown with more assuredness that significant impacts to surface water resources are unlikely and/or can be effectively controlled with mitigation measures.	Please see Section 3.20 in the final EIS and standard resource response Gen-1 and Gen-2.

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ID	Comment	Response
34679-106	Under the section “Great Basin National Park”, the NPS believes that the subsection entitled “Cave Streams” would be more appropriately entitled “Water Resources in Caves.” Given that available evidence indicates that there are indeed streams in some caves, but in other caves there is what appears to be groundwater, this section might be as or more appropriately included in the Groundwater Resources section rather than the Surface Water Resources section as is currently the case. Locating this section near the sections on springs may be the most appropriate, since both groundwater and surface water likely play a role. The NPS thinks that this point needs to be emphasized more in this section.	The heading was changed to "Water Resources in Caves" as suggested. Other comments noted.
34679-107	The NPS agrees with the general sentiment of this section that there is still much uncertainty regarding the hydrologic setting of the caves in the Baker Creek Cave System. As a cooperating agency, the NPS has provided critical input regarding earlier versions of this section that concluded that it was unlikely that the Baker Creek Cave System would ever be affected by the proposed action. The NPS thinks that the draft EIS provides a more thorough accounting of the available information that has been provided to the BLM by the NPS, and we thank you for that. However, the NPS thinks that the section could still be more fairly written to represent the range of possible settings and thus hydrologic connectivity with aquifers in the adjacent valley due to the uncertainty that remains. Specifically, available evidence indicates that some areas of the Baker Creek Cave System may be receiving water that infiltrates through a vadose zone from above, and thus are not hydraulically continuous with adjacent aquifers, but in other areas, specifically in the vicinity of Model Cave, all available evidence indicates that the water in the cave is groundwater and that the aquifer in these limestone rocks is most likely hydraulically continuous with aquifers in the adjacent valley. Ongoing hydrogeologic investigations in Snake Valley by the USGS and the University of Nevada, Reno, in cooperation with the National Park Service, U.S. Fish & Wildlife Service, Bureau of Land Management, and U.S. Forest Service scheduled for completion in early 2012 will likely provide substantial additional information and conclusions regarding groundwater – surface-water interactions in the Baker Creek drainage in the vicinity of the Baker Creek Cave System. The NPS recommends that these new results be considered by the BLM for inclusion in the EIS.	Additional text was added to acknowledge on-going work on cave systems at GBNP.
34679-108	The last sentence of the first paragraph under the heading “Hydrostructural Conditions” states: “The structural geology and tectonic evolution of the region is discussed in Section 3.2, Geologic Resources”, but there appears to be no such discussion in Section 3.2. The NPS suggests that the text be made consistent.	Text modified for consistency.
34679-109	The discussion on fault zones and the hydrologic effect that they have on groundwater flow systems contains much good information. However, the discussion is speculative in places, and does not identify some the principal effects of fault zones. The text discusses (3rd paragraph) damage zones in faults in generalized terms without references and states that these zones can “control the storage and movement of groundwater.” The text goes on to discuss the role of damage zones as conduits along faults and barriers to flow across faults. Although the quantitative significance of these processes is unknown, in general terms this is O.K. Then, the text (4th paragraph) discusses another mechanism in general terms that can behave as an impediment to groundwater flow across a fault – the juxtaposition of layers across the displacement of a fault. The text states: “These faults commonly juxtapose permeable basin-fill sediments against older consolidated rock as well as permeable rocks against low-permeability rocks.” Although in general terms this is likely true, it is also true that these faults commonly juxtapose permeable basin-fill sediments and/or permeable carbonate rocks of the regional carbonate-rock aquifer against other permeable basin-fill sediments and/or permeable carbonate rocks of the regional carbonate-rock aquifer. In this common occurrence, the fault may not act an appreciable barrier to groundwater flow across it. This scenario is not mentioned at all in the discussion, leading the reader to believe, incorrectly, that all faults along all their length behave as barriers to groundwater flow across them. In fact, along the length of the same fault, both scenarios can manifest. A given fault can behave as a substantial impediment to cross-fault groundwater flow along part of its length where there are permeable strata juxtaposed against substantially less permeable strata, and exhibit negligible impediment to cross-fault groundwater flow along another part of its length where there are permeable strata juxtaposed against other permeable strata. In fact, this latter scenario appears to be the case: (1) across range-front faults in southern Snake Valley near Snake Creek; and (2) across the Hogan Springs fault system on the west side of California Wash (HA 218), both within the study area. In both of these cases, permeable carbonate strata on the upthrown block of the fault are juxtaposed against relatively low permeability Tertiary Aged fine-grained strata in the shallow subsurface on the downthrown block of the fault and against other permeable carbonate-rock strata at depth. The upper part of the fault appears to behave as an impediment to cross-fault groundwater flow, while the deeper section of the fault appears to allow substantial cross-fault groundwater flow with some minor hydraulic head loss (likely due to the damage zones described in the text). The NPS respectfully recommends that the text be modified to reflect this range of likely processes and effect of faults on groundwater flow. Thank you.	Additional text was added to the discussion of hydrostructural conditions in response to this comment.
34679-110	In addition to the discussion in this section about normal faults, east-west transverse lineaments, shear zones, and thrust faults, there needs to be a discussion of low angle detachment faults. These are described in detail in the USGS BARCASS report (Welch and others, 2007) and in the recent USGS conceptual-model report of the carbonate province by Heilweil and Brooks (2011).	Additional text was added to refer the reader to Helweil and Brooks 2011 for additional discussions of hydrostructural features.

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ID	Comment	Response
34679-111	The minor subsection titled Groundwater Elevations, Gradients and Potential Flow Directions does not provide any discussion of vertical gradients between the basin-fill aquifer and the carbonate-rock aquifer beneath the project basins or regionally. This is important information to assess if there is a potential for upward or downward groundwater flow between these two aquifers. If pumping by the SNWA is going to occur in both aquifer systems (see page 3.3-98, first paragraph), disclosure of any observed or inferred vertical gradients between the two aquifer systems provides the reader an indication of whether pumping might enhance the potential for upward or downward movement of groundwater from one aquifer system to the other. This presents concerns to the NPS as concentrated pumping in the basin fill aquifer in Snake Valley could enhance the potential for groundwater to move upward from the carbonate-rock aquifer, and thus impact water resources in Great Basin National Park, many of which are fed by the carbonate-rock aquifer. Preliminary review of the groundwater elevations presented in Figure 3.3.1-12 for the carbonate-rock aquifer and Figures 3.3.1-13 and 3.3.1-15 for the basin-fill aquifers in southern Spring Valley and Snake Valley suggests the potential for a natural upward vertical gradient between the two aquifers near the inter-basin flow zone between the southern portions of both valleys. Additionally, on page 3.3-48 (second paragraph), the discussion about the Utah Geological Survey's monitoring network in Utah's west desert mentions there are paired wells completed in the carbonate-rock aquifer and the basin fill aquifers that might have water level data that could shed light on this issue. The NPS respectfully requests that the BLM address this issue in more detail in the final EIS.	Additional text was added to the discussion of Groundwater Elevations, Gradients, and Potential Flow Directions to briefly summarize the information provided in Garner et. al (2011) regarding vertical gradients and interconnection between basin fill and consolidated rock aquifers.
34679-112	All previous discussions on the water resources in Spring Valley, Snake Valley and Cave Valley presented two figures: a depth to water figure and a water level elevation map for each valley. The discussion for Dry Lake and Delamar Valleys only presents a water level elevation map for each valley (Figures 3.3.1-19 and 3.3.1-20, respectively). For the purposes of consistency, the NPS respectfully requests that the BLM provide two additional figures showing the depth to water in Dry Lake Valley and Delamar Valley. The reader cannot ascertain what the depth to groundwater might be from the existing maps for these two valleys, which becomes an issue later on in Section 3.3.2.8 where discussion is presented about the depth to water in Delamar Valley being over 800 feet below ground surface (see page 3.3-90). If depth to water figures for Dry Lake and Delamar Valleys are not provided in the EIS, the reader cannot confirm the validity of statements such as these.	Your suggestion was carefully considered by the BLM but did not result in changes to the document. Available information regarding the depth to groundwater is summarized within the text of the section noted in the comment. Additional information is provided in the Baseline Characterization Report (SNWA 2008) that was incorporated by reference.
34679-113	Preliminary versions of the draft EIS presented perennial yield estimates from earlier investigators in Tables 3.3-13 through 3.3-17. These values are no longer presented in these tables, as NSE recognized perennial yield estimate are presented and discussed in Table 3.3.1-20. Please revise the last water balance component title Yield and Storage Estimates in these five tables to read Storage Estimates, since the BLM has only provided groundwater storage estimates.	Text revised in response to comment.
34679-114	The current discussion in subsection 3.3.1.6 (Water Quality) and Appendix F3.3.4 provides only a general discussion on regional water quality trends. The NPS respectfully suggests that the evaluation and discussion be expanded to identify discrete areas of water quality concern (groundwater and surface water) within the study area that might contribute to water quality degradation resulting from the proposed groundwater development. This issue is raised later in the document (Section 3.3.2.8) as a possible environmental consequence but little or no attempt is made to identify where this might occur in the study area. Instead of providing a range of sampling results in Appendix F3.3.4 under wells and springs, the NPS suggests providing individual results for each sampling point in the project basins and grouping these individual results by groundwater type (i.e., carbonate-rock aquifer vs. valley fill aquifer) and surface water type. Additionally, please provide a figure(s) showing where these sampling points occur in the project basins. Discussion in Appendix F3.3.4 refers to trilinear plots and plots of stable isotope data (deuterium and oxygen-18), but no such plots are presented for the reader to confirm the conclusions presented in the discussion. Please provide these data plots clearly showing the differentiation of groundwater sources (i.e., carbonate-rock aquifer samples vs. valley fill aquifer samples) and surface water sources for each individual sampling point in these basins. This kind of differentiation should help the reader to see whether or not there are areas within these basins with substantially different water quality that could contribute to the migration of poorer quality water toward basins and wells with higher quality water under the influence of project pumping. These areas should be noted in this and subsequent discussions on water quality so that this issue can be adequately addressed under the discussion of modeling results in the final EIS document.	See response WR-6 regarding water quality.
34679-115	The discussion in the first paragraph for Spring Valley indicates a total of 334 active water rights (253 surface water rights and 88 groundwater rights). These two individual totals sum to a total of 341 active water rights. Please double-check the data and correct the text accordingly. Similarly, the discussion in the second paragraph for Spring Valley indicates the annual duty for groundwater rights in Spring Valley is 21,845 afy, which differs from the total of 21,736 afy reported in Table 3.3.1-20 and the sum of the individual amounts (21,702 afy) for Spring Valley. The totals differ by 109 afy to 143 afy, which seems high for a rounding error (per the table footnote). Please double-check the data and correct the text or table, as necessary.	The numbers were checked and revised as necessary.

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ID	Comment	Response
34679-116	The third bulleted water resource issue (noted in line 9) under the discussion about Rights-of-way Issues, which relates to “impacts to surface water quality from project construction-related activities,” does not appear to be addressed or discussed in subsections 3.3.2.2 through 3.3.2.4 as a separate issue. Instead, the discussion in these subsections seems to only focus on the other three bulleted water resource issues on this list. What surface water quality issues (sedimentation issues, accidental releases of hazardous or toxic materials, etc.) were intended to be covered? The NPS respectfully requests the BLM to clarify how and where this issue is being addressed in these subsections, and if it is not, to please provide additional discussion on this important topic. This same concern also applies to subsection 3.3.2.8 in the discussion about Groundwater Development and Groundwater Pumping Issues related to groundwater well field construction and facility maintenance (see third bullet).	The primary water quality concerns associated with construction of the water pipeline are (1) release of hazardous and toxic materials to water resources; and (2) release of sediments to live streams or water sources . The potential for release of hazardous or toxic materials to live streams or springs; and potential erosion and sedimentation effects to streams and springs are briefly summarized in Section 3.3.2 for each alternative. Potential erosion and sedimentation effects to surface water resource associated with construction and operation of the groundwater development areas is described for each alternative in Section 3.3.2. Supplemental descriptions of potential water quality related impacts to surface water resources associated with the ROW and Groundwater development areas for each alternative are provided in Section 3.7.2 (Aquatic Biological Resources). A more detailed evaluation of the potential effects of hazardous material spills to water resources for the ROW and Groundwater Development area construction and operation is provided in Section 3.19 Public Safety and Health.
34679-117	Why wasn’t the proposed mitigation measure ROW-WR-2 described under the minor subsection Flooding also proposed as a mitigation measure for Alternative E under the same discussion for Flooding? The conditions described seem to be identical for Alternatives D and E.	A typographical error was corrected. Text originally stated that "Mitigation measure ROW-WR-2 described under the Proposed Action previously also would apply to Alternative D" Text was revised "would apply to Alternative E and F".
34679-118	Why wasn’t the proposed mitigation measure ROW-WR-2 described under the minor subsection Surface Disturbance of Water Sources also proposed as a mitigation measure for Alternative D under the same discussion for Surface Disturbance of Water Sources? The conditions described seem to be identical for Alternatives D and E.	Text was corrected to indicate that proposed mitigation measure ROW-WR-2 described under the Proposed Action also applies to this alternative.
34679-119	The NPS respectfully requests that additional comparative evaluation and discussion be provided in subsection 3.3.2.7 (Comparison of Alternatives) related to the summary results presented in Table 3.3.2-2. Currently, there is no discussion of the results, only a reference to the table from which the reader is left to draw their own conclusions. The BLM’s lack of any discussion of the results and reliance on the reader to draw their own conclusions from the summary table has the effect of downplaying the significance of the evaluation results. Given the BLM’s stated interest in “receiving comments and suggestions concerning the analysis of the Snake Valley portion of the proposed project and identification of impacts to resources in the area, especially to those in Great Basin National Park” (emphasis added), the NPS respectfully submits the following conclusions drawn from the summary results presented in Table 3.3.2-2 and asks the BLM to include them into the final EIS discussion. • Compared to the Proposed Action or Alternatives A though C, Alternatives D and E pose fewer surface disturbance impacts overall to springs either within or downslope of the ROW. • Compared to the Proposed Action or Alternatives A though C, Alternatives D and E pose fewer surface disturbance impacts overall to perennial streams due to pipeline and power lines crossing perennial streams within the project area. • Compared to the Proposed Action or Alternatives A though C, Alternatives D and E pose fewer surface disturbance impacts overall to intermittent streams due to pipeline and power lines crossing intermittent streams within the project area. • Compared to the Proposed Action or Alternatives A though C, Alternatives D and E pose noticeably fewer surface disturbance impacts overall to ephemeral streams due to pipeline and power lines crossing ephemeral streams within the project area. • Compared to the Proposed Action or Alternatives A though C, Alternatives D and E present the smallest ground disturbance footprint in the project area.• Since Alternatives D and E do not consider a pipeline lateral into Snake Valley, this substantially eliminates any direct surface disturbance-related impacts to resources in Snake Valley or Great Basin National Park when compared to the Proposed Action and Alternatives A through C, which would allow a pipeline lateral into the valley.	The comparison of the potential impacts to water resources associated with construction, operation and maintenance of the Primary ROW related facilities are summarized in Table 3.3.2-2 of the EIS. Your suggestions have been carefully considered by the BLM, but have not resulted in changes to the analyses presented in this document.
34679-120	The NPS respectfully requests that the BLM include the following sentences at the end of the first paragraph of the discussion about the GBNP Model: “The GBNP model also differs from the CCRP model in that it does not model selected faults in the area as discrete horizontal flow barriers as the CCRP model does. Instead, the GBNP model simulates the hydraulic effect of faults as the juxtapositioning of geologic formations with differing hydraulic properties against each other that commonly results from faulting, by assigning different permeabilities to selected geologic formations on both sides of a fault.”The approach used by the USGS to address faults in the model is commonly used by groundwater modelers and illustrates that there are other ways to model fault structures. It is important to note that this approach by the USGS resulted in a calibrated model. Inclusion of this new language is critical to providing a fair differentiation of the GBNP model from the CCRP model, especially when the results from both models are compared in the later discussion related to Alternative D. If there are differences in the results of both models, it may be partially related to the differences in how fault structures are treated in the models.	Additional text was added to the paragraph referenced in the comment to briefly summarize how the GBNP simulated the effects the of faulting.
34679-121	In addition to the discussion in this section about normal basin and range faults, strike-slip faults, caldera bounding structures, and regional thrust faults, there needs to be mention of low angle detachment faults such as the well know Southern Snake Range Detachment (SSRD). These faults are described in detail in the USGS BARCASS report (Welch and others, 2007) and in the recent USGS conceptual-model report of the carbonate province by Heilweil and Brooks (2011).	Additional text was added to this paragraph in response to the comment.

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ID	Comment	Response
34679-122	In the discussion under the minor subsection titled Defining the Drawdown Area, the BLM describes in three bulleted discussions how the drawdowns used in the impact evaluation were calculated. In particular, the second bulleted discussion describes how the incremental drawdown attributable to each specific pumping scenario was calculated. As currently described in the second bulleted discussion, the incremental effect from the GWD project is being defined as the incremental contribution from the GWD project to the combined drawdown impact resulting from past and existing pumping (i.e., No Action pumping), plus the proposed project pumping. Based on this description, the NPS is concerned that the BLM may not be correctly estimating the degree and magnitude of the incremental drawdown associated with the GWD project, and therefore, may not be complying with the intent of the NEPA. The NPS respectfully contends that the incremental drawdown should be defined as the incremental contribution from the GWD project to the total cumulative drawdown impact that the BLM is required to evaluate under the NEPA.	The second bullet on page 3.3-87 in the DEIS referenced in the comment actually describes the methodology used to identify the incremental effects associated with the groundwater withdrawals that would occur under the Proposed Action and its alternatives. The incremental effects analysis was necessary in order to separate out the effects attributable from each alternatives from effects that would occur in the region under the No Action Alternative. The "incremental effects" analysis was designed to evaluate the "indirect effects" of these actions as defined in Section 1502.16 (Environmental Consequences) and 1509.8 of the CEQ NEPA regulations.
34679-123	The total cumulative impact is defined under the NEPA as the combined incremental impacts contributed from: (1) past and existing actions (i.e., the No Action alternative), (2) the proposed project (i.e. Proposed Action and other alternatives) being considered, and (3) all reasonably foreseeable future actions. Based on the definition of the total cumulative impact recognized under the NEPA, the incremental impact of the proposed project would be calculated as the difference between (a) the total cumulative drawdown described in the third bulleted discussion on page 3.3-87 and (b) the total drawdown simulated in the special case represented by the No Action pumping plus the reasonably foreseeable future pumping (i.e. No Action cumulative pumping scenario). These same two model simulations were completed by the BLM as part of their cumulative effects evaluation presented in section 3.3.3-4 (see page 3.3-191), with the results for each alternative summarized in Table 3.3.3-1. By taking the difference between the results for the Proposed Action cumulative scenario (or Alternatives A through E cumulative scenarios) and the No Action cumulative scenario in Table 3.3.3-1 for any particular water resource issue (e.g., drawdown effects on perennial springs), one can calculate the incremental effect contributed by the Proposed Action (or Alternatives A through E) to the total cumulative effect for any particular water resource issue. When the incremental effects are calculated in the same manner for all of the water resource issue for the Proposed Action cumulative scenario (or Alternatives A through E cumulative scenarios) presented in Table 3.3.3-1 and compared to the same incremental effects summarized in Table 3.3.2-22 that were calculated using the BLM's methodology described in the second bulleted discussion on page 3.3-87, there are differences in the results. In many cases, the incremental effects calculated using the proposed NPS method are greater than the same increment effects calculated using the BLM's method, while in other cases the incremental effects calculated using the NPS method are less than the same increment effects calculated using the BLM's method.	The Council on Environmental Quality (CEQ) NEPA regulations define cumulative impacts in Section 1508.7: "The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individual minor but collectively significant actions taking place over a period of time." The water resources analysis provided in the EIS evaluated both the incremental and cumulative effects to water resources associated with the groundwater pumping scenarios included in the Proposed Action and alternative to the Proposed Action using the methodology described in Section 3.3.2.8. The cumulative pumping scenarios used for the model simulations of these alternatives were developed specifically to comply with the requirements of CEQ regulation 1508.7 and include the combined effects of the incremental impacts of the action added to other past, present, and reasonably foreseeable future actions.
34679-124	The difference between these two sets of results suggests that the BLM may be using the wrong basis for correctly estimating the incremental impacts of the GWD project, as originally intended under the NEPA. The NPS respectfully requests the BLM to review their NEPA guidance procedures related to estimating the incremental effect from the proposed project to determine if the current method is in error and needs to be corrected.	Section 1502.16 (Environmental Consequences) of the Council on Environmental Quality (CEQ) NEPA regulations specify that the EIS "…. Shall include discussions of: … (b) indirect effects and their significance. Section 1508.8 defined indirect effects: "Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." CEQ regulations do not attempt to specify the methodology that must be used to evaluate these indirect effects. The water resources analysis provided in the EIS evaluated the indirect effects to water resources associated with the groundwater pumping scenarios included in the Proposed Action and alternative to the Proposed Action using the methodology described in Section 3.3.2.8. The pumping scenarios used for the model simulations of these alternatives were developed specifically to comply with the requirements of CEQ regulation 1502.16 and 1508.8 to evaluate the potential indirect effects associated with groundwater withdrawal under the various alternatives considered in the analysis.
34679-125	ID of Springs and Streams Susceptible to Drawdown Impacts Section: Second paragraph, first sentence is not true. The source of the groundwater is not the determining factor. The second sentence is true. The degree of hydraulic connection, if any, is controlled by the specific hydrogeologic conditions at each site. The NPS recommends that you recast the second sentence to make it the topic sentence of this paragraph. Further in this second paragraph, it is stated that: "…it is not possible to conclusively identify specific springs and seeps that would show effects from future drawdown from the various pumping scenarios considered in this analysis." This is attributed to "the complexity of the hydrogeologic conditions" and "inherent uncertainty in numerical modeling predictions." The NPS agrees that for the study area as a whole, the first part is correct, except where site-specific studies have been done that have evaluated the hydrogeologic conditions. The NPS thinks that the second part is not true in some areas. The numerical modeling predictions indicate that some areas would be subject to 10's to over 100 feet of drawdown. That is enough information to say that, if there is hydrologic connection (the first part), then there is high risk of adverse effects. In conclusion, the NPS agrees that an analysis of model predicted drawdown and of hydrologic connection with adjacent aquifers are both needed to assess risk of impact. The model provided a regionalized programmatic estimate of the former. The latter likely needs to be estimated based on assumed processes and the authors' judgment, as was done, but that in areas where there are site specific studies, those should take precedence.	The first sentence of the paragraph was revised for clarification in response to the comments. Other comments are noted. In most areas, the hydrogeologic conditions between the well field areas and the surface water sources are relatively complex and uncertain. The hydrogeologic complexities and uncertainties are discussed in Section 3.3. Regardless of the site specific data that may be available for a spring or stream, in most cases, particularly where the surface water feature is located some distance from the pumping wells; or where there may be a lack of continuity of the aquifer or aquifer parameters between the surface water feature and the pumping wells, there would be a considerable level of uncertainty associated with any attempt to predict the timing and rate of flow reduction that would occur at these sites.

Comments and Responses - Federal Government

ID	Comment	Response
34679-126	In the discussion about adjusting the risk zone ratings if there was sufficient water level data available to do so, please elaborate on why the BLM chose a depth-to-water of >100 feet to adjust the risk level from “high” to “moderate” and a depth-to-water of >150 feet to adjust the risk rating from “high” to “low.” What was the scientific basis for choosing these two depth-to-water levels? How many individual monitoring points were deemed necessary to judge the average depth-to-water in a given valley? Do these depth-towater levels represent an average of the available water level measurements in a given valley?	See response to #127 (below) regarding the dataset and methodology used to incorporate depth to groundwater data into the risk evaluation. An explanation of the criteria used to incorporate the depth to groundwater dataset into the risk analysis was described in the paragraph referenced in the comment. The basis for using depth to groundwater data is the fact that if regional groundwater elevations are near the ground surface there is a high potential for perennial surface water features to be connected to and controlled by discharge from the regional flow system. Conversely, where the elevation of the groundwater surface is situated a considerable distance below the ground surface, surface water resources are less likely be interconnected to or controlled by discharge from the regional aquifer system. The 100 foot depth to water was selected to provide a relatively conservative criteria for delineating areas with "shallow" groundwater conditions for the purpose of identifying area with relative "high" risk to surface water resources; the<150 foot criteria was used to add an additional conservative factor in the analysis to identify areas where there was a relative "moderate risk" of drawdown affects accounting for the fact that site specific water level data is generally not available for most areas within the region of study. The evaluation did not use an average depth to water for the entire basin but rather considered the general depth to water provided in the dataset for each specific area.
34679-127	The BLM currently recognizes the potential risk to water resources throughout Cave, Dry Lake and Delamar Valleys as “low” based on this depth-to-water criteria, but examination of the depth-to-water map for Cave Valley indicates that depths to water in the northern half of the valley range from 0 to 233 feet below ground surface, with an average depth of about 78 feet for the eight northern-most points of measurement noted on Figure 3.3.1-18 in the valley. Based on the BLM’s depth-to-water criteria, the northern portion of the valley floor in Cave Valley should still receive a “high” risk rating instead of a “low” risk rating. Additionally, Figure 3.3.1-7 shows a large evapotranspiration area in the far southern end of Cave Valley which suggests that shallow groundwater is present in the subsurface. Unfortunately, there are no wells in this area to confirm shallow water levels in the mapped evapotranspiration area. The presence of this evapotranspiration area in the southern portion of Cave Valley coupled with the water level observations for the northern half of Cave Valley calls into question the broad application of assigning a “low” risk to the whole valley when it appears large portions of the valley floor area probably should be assigned a “high” risk rating based on the available information presented in the draft EIS. The NPS respectfully requests that supporting depth-to-water maps be presented in the final EIS for Dry Lake and Delamar Valleys (see comment for page 3.3-52 and 3.3-53) and many of the other valleys throughout the groundwater model area where the BLM seems to have applied this arbitrary depth-to-water criteria (see the figures presented in Appendix F3.3.8 showing the risk zones for the cumulative effects results throughout the modeled area), so that the reader can independently confirm the water levels are sufficiently deep over a wide area beneath the floors of these valleys. The NPS is not convinced that the BLM’s broad interpretation of a “low” risk to impact throughout the valley floor area for many these valleys can be substantiated with the information presented in the draft EIS.	The evaluation of depth to groundwater used a compilation of available wells with water level elevation data available at the time the analysis was conducted (March, 2011). This included the steady-state water-level data for wells provided in Table A.2-1 in Appendix A in the Baseline Characterization Report for the project (SNWA 2008) that was summarized and incorporated by reference in Section 3.3.1.5 of the EIS. This report was also provided on a CD included with the DEIS. EIS figure 3.3.1-18 indicates the depth to water fin Cave Valley or the wells provided in the dataset. The comment incorrectly claims that the EIS determined that the risk to springs in was ”low” throughout Cave Valley. In fact, the depth to water data was used to delineate areas of ‘high” and “moderate” risk in the northern portion of the valley; and areas of “low” risk in the southern portion of the valley (where the depths to water ranges are greater than 150 feet). These areas of risk within the drawdown areas are shown on the maps provided in Appendix 3.3.8 Areas of Potential Risk within Predicted Drawdown Areas. The results for Delamar Valley were described in the text of the EIS and indicate that the groundwater is situated >800 feet below the surface and is therefore, not connected to surface water features within this basin. For Dry Lake Valley, the data set (presented on EIS Figure 3.3-1-19) indicated that there were 12 wells scattered from north to south across the basin with relatively large depths to groundwater that ranged from 255 feet to 848 feet below ground surface. These water levels are inferred to represent the regional groundwater flow system that could be affected by drawdown from the proposed project groundwater development. These data suggests that the depth to the regional basin fill and carbonate aquifer system is relatively deep (i.e. >200 feet beneath the ground surface), and therefore, the relative risk to surface water resources in this basin from the proposed pumping was estimated to be relatively “low” for the purposes of the programmatic analysis. There are also several shallow wells located in the eastern portion of the valley and in the valley margin areas with very shallow groundwater depths (3-50 feet) reportedly were completed in volcanic rocks or alluvium. The geographic location of these shallow water level wells compared to the deeper wells located in the valley floor combined with the discontinuity between the deeper (255 to 848 feet) water levels and shallow (3-50 feet) water levels suggest that these shallow water levels most likely represent localized or perched groundwater conditions that would not likely be affected by pumping of the deeper groundwater flow system.
34679-128	ID of Susceptibility in Great Basin NP: In the third paragraph of this section, it is stated that “Results from the study indicate that surface-water resources in most of the Park are not susceptible to ground-water pumping in the adjacent valleys.” The NPS agrees with this statement, but feels that it would be appropriate and fair to then describe that the areas that were delineated as “likely susceptible” are in important areas near the main entrance to the Park and include areas of Lehman Creek, Baker Creek, and Rowland Spring in the karst areas that include the Lehman Caves and the Baker Creek Cave System, which are .fundamental to the purposes for which this area was made into a National Park. Furthermore, it would be fair in this part of the text to then add that in response to Dr. Prudic’s (2006) citation that “these warrant additional monitoring and study”, that such monitoring and study has been going on from 2006 to 2011, and that a new USGS Scientific Investigations Report that describes the results of these investigations is likely to be publically available in early 2012.	Your suggestions have been carefully considered by the BLM, but have not resulted in changes to the analyses presented in this document. The additional description requested relative to park resources is provided the referenced documents that have been incorporated by reference.
34679-129	In the second paragraph under the minor subheading titled Construction and Operation, the NPS respectfully requests that the second sentence in this paragraph by revised with additional text (presented in italics) to read as follows: “This includes 23 perennial stream reaches (total length of 20.2 miles) located in Spring Valley and 5 reaches (total length of 8.8 miles) located in Snake Valley.” The NPS believes it is important to note the total stream length in both valleys so that the reader can better understand the relative degree of impact in each valley.	The total length of the stream reaches was added to the paragraph as requested.

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ID	Comment	Response
34679-130	Discussion in the first paragraph under the minor subheading titled Groundwater Pumping Scenario notes the following statement: “For all pumping scenarios, pumping simulations were set up such that production wells associated with the SNWA groundwater development project were completed (depending on location) in either the Upper Valley Fill, Lower Valley Fill, or Lower Carbonate unit.” Based on this statement, the NPS respectfully requests additional clarification on what hydrogeologic unit the current drawdown maps represent throughout the remaining discussion in Section 3.3.2. For example, do the drawdown maps presented in Figures 3.3.2-3, 3.3.2-4 and 3.3.2-5 represent drawdown in the Upper Valley Fill, Lower Valley Fill, or Lower Carbonate unit? There is nothing in the discussion or in the figures to indicate which hydrogeologic unit is being portrayed. If the SNWA will be pumping from multiple hydrogeologic units in the Proposed Action or alternatives, as this statement suggests, then the NPS respectfully requests the BLM to provide separate drawdown figures and appropriate discussion of impacts for each hydrogeologic unit so that the reader can ascertain the potential drawdown effects within each hydrogeologic unit. The NPS is concerned that if pumping will be occurring in Spring Valley and Snake Valley from the Lower Carbonate unit, the pumping effects could propagate into Great Basin National Park much more quickly, given that groundwater flow in the carbonate-rock aquifer is largely controlled by fractures and karst solution features. Many of the springs within the park are issuing directly from carbonate rock and could be directly affected by pumping in the Lower Carbonate unit. Drawdown maps for the Lower Carbonate unit might also allow the BLM to make more definitive conclusions on the effects of pumping on cave features in an around the park.	The drawdown maps represent model simulated reduction of the elevation of the water table (Section 4.2.1, SNWA 2010) and are not specific to hydrogeologic units. Specifics regarding the location or design of the production wells are not available for the programmatic level impact assessment of groundwater pumping. Based on the plan of development, regardless of the location of the well head (i.e. at the surface) it is assumed that all groundwater development wells would be design to produce groundwater from the regionally interconnected carbonate and alluvial aquifer system and not be designed to extract water from local or perched aquifer systems not connected to the regional groundwater flow system. See Section 3.3.1.5 of the EIS for additional discussion of available water level data indicating that the carbonate and alluvial aquifer systems are assumed to represent a single aquifer system (Gardner et al 2011; Sweetkind et al 2011).
34679-131	In the fourth paragraph under the minor subheading titled Impacts to Water Levels, the NPS respectfully suggests that the BLM provide additional language to the discussion indicating the total area (miles squared) encompassed by the 10-foot drawdown contour for the Proposed Action model simulation. This additional information will help the reader to more fully understand the size of the affected area, beyond just describing the general dimensions of the drawdown area. Similar additional language should be provided under similar discussions presented for Alternatives A through E and the No Action alternative.	The drawdown areas for all alternatives at the representative timeframes is shown on the series of maps provided in Section 3.3.2 and in Appendix F3.3. Quantification of the square miles of drawdown is not relevant to the description of potential impact of water resources since the impact assessment is based on determining the relative risk to water resources based on the projected drawdowns combined with the general geomorphic setting, geology, and depth to groundwater as described in Section 3.3.8.
34679-132	In the last paragraph under the minor subheading titled Impacts to Water Levels, the NPS respectfully requests that the last sentence in this paragraph by revised with additional text (presented in italics) to read as follows: “These results further suggest that with continued pumping beyond 200 years, additional drawdown is likely to occur for several hundred more years after the model simulation period (i.e., after the full build out plus 200 year period).” This additional text is important to give the reader additional context on how long it may take for groundwater levels to stabilize in the study area, and is based on additional model runs that the NPS conducted as a cooperating agency, with help from its groundwater modeling consultant TetraTech-GEO (formerly Geo-Trans, Inc.), using the previous version of the CCRP model. The results of these additional model runs were previously presented to the BLM in a report for further consideration in developing the draft EIS.	See response WR-2 regarding the selection of the timeframes used for description of potential effects to water resources.
34679-133	In the first paragraph under the minor heading titled Impacts to Springs and Streams, please provide a reference where Table F3.3.9-1A can be found.	Reference to Appendix F3.3.9 added for clarification.
34679-134	Comparison of the results presented in Table 3.3.2-6 with a similar table presented in the most recent preliminary version of the draft EIS that was reviewed by the cooperating agencies indicated that the results for effects on perennial springs and streams, and surface water rights vary dramatically from what was last previewed. The comparison indicated that the results at full build-out plus 200 years were approximately 15% to 40% lower than previously presented by the BLM. There also was a very small reduction in the results for the effects to groundwater rights (generally<5%) that occurred this time around as well. Please explain the reason(s) for the wide difference in the results this time around, as the NPS did not expect these results to change in the draft EIS. The NPS has noticed a similar trend in Tables 3.3.2-9, 3.3.2-11, 3.3.2-14, 3.3.2-16, 3.3.2-18, and 3.3.2-20 that present similar results for the other alternatives discussed throughout the rest of the draft	The results provided in Table 3.3.2-6 and other similar water resource effects summary tables provided in the document reflect the results of the water resource risk evaluation methodology provided in Section 3.3.2.8 of the EIS. As described in this section, the water resource analyses used the geomorphic setting defined in Table 3.3.2-3 combined with available water level data to define the risk to perennial water resources. During development of the DEIS, the analysis was updated and refined as necessary to reflect the available information for the region relevant to the impact evaluation. The available information used in the analysis is provided in Appendix F3.3 and in the referenced documents provided with the CD included with distribution of the DEIS.
34679-135	The NPS respectfully requests that the BLM present additional discussion on which valleys experience the greatest impact to the inventoried and other springs contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been overlooked or downplayed in the current discussion. This information exists in Table F3.3.9-1A (Appendix F3.3.9) and should be summarized and discussed accordingly. The NPS respectfully requests that the last sentence in this paragraph be revised as follows to address this issue: “The greatest impact to these springs at the full build-out plus 200 year period occurs in Spring Valley (184) (34 inventoried, 166 other) and Snake Valley (14 inventoried, 57 other), with lesser impact occurring Lake Valley (5 inventoried, 12 other), and Steptoe Valley (1 inventoried, 5 other).” This simple revision allows the reader to see that pumping under the Proposed Action will likely result in proportionately greater impacts to Spring Valley and Snake Valley springs than the other affected valleys.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

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ID	Comment	Response
34679-136	The NPS respectfully requests that the BLM present additional discussion on which valleys experience the greatest impact to the perennial streams contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been overlooked or downplayed in the current discussion. This information exists in Table F3.3.11-1A (Appendix F3.3.11) and should be summarized and discussed accordingly. The NPS respectfully requests that the last sentence in this paragraph be revised as follows to address this issue: “The greatest impact to perennial streams at the full build-out plus 200 year period occurs in Snake Valley (63 miles) and Spring Valley (184) (38 miles), with lesser impact occurring in Steptoe Valley (4 miles), and Lake Valley and Lower Meadow Valley Wash (3 miles).”This simple revision allows the reader to see that pumping under the Proposed Action will likely result in proportionately greater impacts to Snake Valley and Spring Valley perennial streams than the other affected valleys.	See Response WR-8.
34679-137	In the third paragraph under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the NPS respectfully requests that this paragraph by revised with additional text (presented in italics) to read as follows: “In the Great Salt Lake Desert Flow System, spring discharge was simulated at 3 springs in Spring Valley and 4 springs in Snake Valley. In Spring Valley, the model simulations indicate that by full build out plus 75 years, Keegan, North Millick, and South Millick springs all show moderate to substantial reductions of flow (62 to 100 percent). At full build out plus 200 years, these springs are predicted to experience flow reductions ranging from 75 to 100 percent. These three springs are all located near the margin of the valley floor in the north central portion of the valley. These results, coupled with the drawdown results, suggest that springs located in the southern portion of the valley that are hydraulically connected to the regional flow system are likely to experience moderate to substantial reductions in flow over the long term, with the strong likelihood of many springs drying up.”The NPS believes these additional text revisions provide a more fair and balanced interpretation of the likely impacts that will befall many of the springs in the north-central and southern portions of Spring Valley, based on the results presented in the draft EIS for the Proposed Action. The current description of “some reduction in flow” downplays the degree of impact many of these springs are likely to experience if they are hydraulically connected to the regional flow system. These additional text revisions are also supported by the fact that these index springs appear to be located in the high-risk valley floor area (see Figures F3.3.8A-2 and F3.3.8A-3), where the BLM has identified that pumping-related impacts are likely to occur to perennial water resources that depend on flow from the regional groundwater flow system.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-138	In the fourth paragraph under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the NPS respectfully requests that the last sentence in this paragraph by revised with additional text (presented in italics) to read as follows: “The results suggest that the springs located on the valley floor in the southern portion of the valley likely would experience substantial reductions in flow, with the strong likelihood of many springs drying up. This outcome is further supported by the observation that Needle Point Spring, located northeast of Big Springs in Utah, dried up in response to comparatively smaller agricultural pumping in the area.” The NPS believes the additional text revisions provide a more fair and balanced interpretation of the likely impacts that will befall many of the springs in the southern portions of Snake Valley, based on the results presented in the draft EIS for the Proposed Action. The current description of “would experience reductions in flow” greatly downplays the degree of impact many of these springs are likely to experience if they are hydraulically connected to the regional flow system. These additional text revisions are also supported by the fact that Big Springs appears to be located in the high-risk valley floor area (see Figures F3.3.8A-2 and F3.3.8A-3), where the BLM has identified that pumping-related impacts are likely to occur to perennial water resources that depend on flow from the regional groundwater flow system. Additionally, the fact that the BLM’s own Needle Point Springs dried up 10 years ago due to comparatively smaller agricultural pumping in the area (see discussion on pages 3.3-24 and 3.3-25), strongly suggests that the much greater pumping under the Proposed Action will most likely substantially reduce or dry up many other springs in the southern portion of Snake Valley. This direct line of evidence should be included in the discussion and not ignored.	See response WR-8 regarding request for additional text.
34679-139	In the first paragraph under the minor subheading titled Water Resources Within or Adjacent to GBNP, the NPS respectfully requests that the BLM include recognition in the discussion that 0.5 miles of Lehman Creek and its tributaries are located within the area of moderate risk by the full build-out plus 200 years period. This result is reported in Table 3.3.2-8 for the Proposed Action and should be acknowledged in the discussion.	The text was modified to add the description of risk to Lehman Creek as requested in the comment.

Comments and Responses - Federal Government

ID	Comment	Response
34679-140	In the fourth paragraph under the minor subheading titled Impacts to Surface Water Rights, the NPS respectfully requests that the BLM present additional discussion on which valleys experience the greatest impact to surface water rights contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been neglected in the current discussion. This information exists in Table F3.3.13-1A (Appendix F3.3.13) and should be summarized and discussed accordingly. The NPS respectfully requests that an additional sentence be added to the end of this paragraph as follows to address this issue: "The greatest impact to surface water rights at the full build-out plus 200 year period occurs in Spring Valley (184) (122 water rights) and Snake Valley (59 water rights), with lesser impact occurring in Lake Valley (18 water rights), Steptoe Valley (5 water rights), and Cave Valley and Hamlin Valley (3 water rights each)." This additional language allows the reader to see that pumping under the Proposed Action will likely result in proportionately greater impacts to Spring Valley and Snake Valley surface water rights than the other affected valleys	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-141	In the fourth paragraph under the minor subheading titled Impacts to Groundwater Rights, the NPS respectfully requests that the BLM present additional discussion on which valleys experience the greatest impact to groundwater rights contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been neglected in the current discussion. This information exists in Table F3.3.15-1A (Appendix F3.3.15) and should be summarized and discussed accordingly. The NPS respectfully requests that two additional sentences be inserted in front of the last sentence of this paragraph as follows to address this issue: "The greatest impact to groundwater rights that experience a predicted drawdown of at least 10 feet at the full build-out plus 200 year period occurs in Snake Valley (129 water rights) and Spring Valley (184) (72 water rights), with lesser impact occurring in Lake Valley (38 water rights), Hamlin Valley (11 water rights), Cave Valley (7 water rights), Dry Lake Valley (6 water rights), and Delamar Valley (1 water right). It should be noted that the greatest magnitude of drawdown impact will occur in Snake Valley, where 25 out the 129 water rights could experience drawdown greater than 100 feet." This additional language allows the reader to see that pumping under the Proposed Action will likely result in proportionately greater impacts to Snake Valley and Spring Valley groundwater rights than the other affected valleys.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-142	In the third paragraph under the minor subheading titled Impacts to Water Balance, the NPS respectfully requests that this paragraph by revised with additional text (presented in italics) to read as follows: "For Spring Valley, the pumping is estimated to result in substantial reductions of groundwater discharge for ET that increase from a 77 percent reduction at full build out plus 75 years to a 84 percent reduction at full build out plus 200 years. In Snake Valley, the pumping is estimated to result in moderate reductions of groundwater discharge for ET of 28 percent at full build out plus 75 years and 33 percent at full build out plus 200 years, with most of this reduction occurring in the southern portion of the valley." The NPS believes these additional text revisions provide a more fair and balanced interpretation of the likely impacts that will befall Spring Valley and Snake Valley, based on the results presented in the draft EIS for the Proposed Action. The current description of "estimated to result in reductions of groundwater discharge for ET" downplays the degree of ET reduction that is likely to occur in Spring Valley and Snake Valley. A potential 77% to 84% reduction in groundwater ET in Spring Valley is substantial compared to the status quo, and could have considerable implications on associated vegetative communities and air quality.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-143	The NPS respectfully suggests that the discussion provided under the minor subheading titled Impacts to Water Quality is too general and should attempt to provide at least a reconnaissance-level evaluation. This subject requires more interpretation to understand some of the impact possibilities, and if the various water quality-related environmental consequence issues outlined in subsection 3.3.2.8 are to be adequately addressed for a final Tier 1 EIS. This issue potentially has indirect impacts on aquatic species and vegetation resources in these basins. Comments and concerns with the discussion presented in this subheading include: • Expand the foundation from which an assessment of potential water quality impacts can be made. See NPS's previous comment for pages 3.3-58 and 3.3-59. • Evaluate the potential for whether the quality of water sourced from two different hydrologic units could be significantly impacted if a reduction of flow from one of these sources of water occurs. A reconnaissance-level evaluation could be supported by conducting simple geochemical mixing analyses (e.g., use of a trilinear diagram) of different possible source waters to evaluate the possibility of whether a significant reduction in flow from one of the sources could potentially affect the resulting water quality of these waters. Springs that have water quality data indicating a mixed source of water would be good candidates for such an analysis. • Evaluate the potential for water quality impacts that might occur from leakage of groundwater from one HGU to another as a result of pumping-induced vertical gradients between the two HGUs. No discussion on background or pumping-induced vertical gradients has been provided to even look at this issue. Did the modeling results indicate (or even evaluate) areas in the model domain where vertical leakage of groundwater was induced or increased? If these areas can be identified and groundwater quality data exists for these areas, then BLM should be able to perform some simple mixing analyses (e.g., use of a trilinear diagram) to estimate the resulting impact on water quality in the affected aquifer(s).	See response WR-7 and additional text provided in Section 3.3.2.9 regarding potential impacts to water quality. As described in Section 3.2, available information indicates that the carbonate aquifer and basin fill aquifers behave in most areas as one interconnected aquifer system. Also see response WR-1 regarding the programmatic nature of the water resource analysis and the fact that future tiered NEPA will evaluate more local scale or site specific effects associated with the well location, well design and pumping rates after that information in a development plan to the BLM.
34679-144	The first two bulleted items at the top of page 3.3-117 identify two possible adaptive management measures that could be deployed in the event early-warning thresholds are reached. These measures include augmentation of affected water supplies using surface and groundwater sources, and conducting recharge projects to offset drawdown impacts. The NPS respectfully requests that the BLM provide additional information on the source of the water that would be used for these two measures. Does this water source include existing water rights that the SNWA may hold, use of groundwater rights that may be granted to the SNWA in these basins, or both? In the event this water source includes groundwater rights that may be granted to the SNWA, how would the implementation of either measure differ from implementing the measure of reducing or ceasing pumping? It seems to the NPS that the net effect is the same; if the SNWA uses a portion of their granted groundwater rights to offset pumping impacts via augmentation or artificial recharge, the result is a reduced volume of groundwater being exported from the project basins, similar to reducing and/or ceasing a portion of their pumping.	The monitoring and mitigation for this project is complex and extensive. The BLM is looking at two separate processes for the development of the monitoring and mitigation plans for this project. Currently, there are stipulated agreements which have been developed through the Nevada State Water Engineer that BLM contributed to. BLM also manages surface and mineral resources for federal lands it administers under FLPMA and BLM has developed a project-wide COM Plan to protect federal resources that may be impacted by construction, operation, maintenance and abandonment of the project related facilities (see revisions to Section 3.20). This section outlines the process that BLM will follow, now and in the future, for mitigation for this project. Mitigation related to groundwater development will be included in subsequent NEPA and associated valley-specific COM Plans as described in Section 3.20. All comments on the stipulated agreements have been provided to the executive committee overseeing the implementation of those agreements.

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ID	Comment	Response
34679-145	The NPS commends the BLM for proposing mitigation measure GW-WR-3: Monitoring and Modeling as an important step to evaluating the potential impact of GWD project pumping on resources of concern and whether or not these impacts can be effectively mitigated. This is a new element in the EIS on which the NPS has not had an opportunity to comment. In the third paragraph under the discussion about mitigation measure GW-WR-3, the NPS respectfully requests that this paragraph by revised with additional text (presented in italics) to read as follows: "In addition to the regional groundwater flow model, the SNWA would develop more detailed (local scale) groundwater flow models designed to simulate the effects of pumping within each specific basin. These basin specific models would be developed and approved by the BLM prior to the BLM's Tier 2 NEPA review of specific groundwater development activities proposed by the SNWA. The basin specific models would be linked to the regional model. This can be accomplished by constructing a separate model whose boundary conditions are linked to the regional model, or constructing an "embedded" model where the local model is coupled to the regional model, or using another method approved by the BLM. Following development of the basin specific models, the BLM will utilize the basin specific models to conduct a more detailed Tier 2 NEPA evaluation of potential project-related pumping impacts once the number and positioning of the SNWA's well fields are finalized, as a check against the Tier 1 NEPA evaluation which utilized the regional groundwater model. Additionally, the BLM will use the basin specific models to critically evaluate the effectiveness of the proposed ACMs and adaptive management measures before allowing construction of any pipeline lateral and well fields in a particular basin. In the event the basin specific modeling results indicate that pumping impacts cannot be effectively mitigated with the proposed measures, the BLM reserves the right to modify the ROD with respect to reversing or finalizing their decision on granting a ROW for that particular pipeline lateral. The basin specific models also will be recalibrated at least every 5 years (after pumping is initiated) or sooner if the BLM identifies major differences between the model simulations and monitoring results and determines that model recalibration is necessary." The NPS believes this additional language is necessary to address the NPS's previous concern about a potential flaw in the current tiering approach in which the BLM runs the risk of granting a ROW following the Tier 1 analysis, only to potentially find out in a Tier 2 analysis that pumping impacts in a basin (e.g., Snake Valley) are too substantial and cannot be mitigated effectively. Under this scenario, if the SNWA is allowed to construct the pipeline into a basin prior to completing the Tier 2 NEPA analysis, then the SNWA could be forced by the BLM to remove the pipeline segment, based on unfavorable findings resulting from the Tier 2 analysis. This additional language would protect the SNWA and its constituent water districts and rate payers from expending considerable amounts of money to construct the pipeline lateral into a project basin, before all of the direct and indirect impacts from pumping are known with more certainty. The basin specific models also provide a powerful tool to critically assess the effectiveness of the proposed mitigation measures, which has not been done at this time. This additional language is important to include given the BLM's expressed uncertainty with some of the programmatic Tier 1 analysis (e.g., regional groundwater modeling results and impacts to water resources and other water-dependent resources) which is to be resolved in future tiered analyses.	The FEIS has been revised to address the comment. Additionally, please see Standard Resource Responses MM-1, MM-2 and Gen-1.
34679-146	In the discussion about proposed mitigation measure GW-WR-5: Shoshone Ponds, the BLM recognizes that GWD project pumping is likely to impact the artesian source of water that supports important aquatic resource for Shoshone Ponds, and suggests this impact can be mitigated by improving the existing flowing well that supplies water or by drilling and installing a new pumping well that can supply water of equivalent quality. The BLM also recognizes that pumping water to replace the existing artesian water supply would result in an incremental increase in drawdown due to well interference effects from pumping at the new well and nearby pumping from the larger GWD project. Over time, these well interference effects should continue to lower groundwater levels in the vicinity of Shoshone Ponds, possibly to the point of the new well going dry. If groundwater levels do drop to a point where replacement pumping cannot be sustained, the important aquatic resources could be adversely impacted. Has the BLM looked at the sustainability of this approach over longer periods of time and are there any contingencies in place to address the possibility of this well going dry? Additionally, were the mitigation measures of distributed pumping, cessation or reduction in pumping, or avoidance of pumping in this area evaluated as alternatives to the proposed mitigation measure?	Thank you for your comment. Please see Standard Resource Responses MM-1, MM-2 and WR-4.
34679-147	With respect to the discussion about the proposed mitigation measure GW-WR-6: Well and Water Rights, the NPS respectfully requests the BLM to provide additional discussion in the final EIS on the viability of this measure at mitigating impacts to springs and surface water in Great Basin National Park, given the NPS's legal directive of protecting these natural features "unimpaired for the enjoyment of future generations." The NPS recently applied for non-consumptive, in-stream water rights on several of the streams within the park, which would require that a minimum flow be maintained in these streams to protect the aquatic species that reside in these streams. Furthermore, the NPS is unaware of any replacement surface water rights that the SNWA has in Snake Valley that could even be used to augment the loss of surface water rights in the valley. Even if the SNWA did have these replacement surface water sources or groundwater sources of equivalent quality, using them to artificially replace the loss of natural spring and stream flow in the national park is counter to the NPS's legal directive.	Thank you for your comment. Please see Standard Resource Response MM-1.

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ID	Comment	Response
34679-148	Previous discussion on page 3.3-119 identified several adaptive management practices that could be implemented by the SNWA under a proposed Monitoring, Mitigation and Management Plan for Snake Valley to reduce adverse impacts to discharge at perennial water sources. Two of these measures, geographic re-distribution of groundwater withdrawals and reduction or cessation in groundwater withdrawals, are recognized on page 3.3-122 (lines 4 to 6) in the discussion under the minor subheading titled Potential Residual Effects as offering the best solution for minimizing adverse impacts to the water resources. However, the BLM also recognizes that cessation or reduction of pumping may be ineffective based on the fact that recovery of water levels in specific areas of interest could take several years or decades and may not successfully mitigate long-term impacts to surface water resources in the area (see lines 7 to 10). As a result, the BLM states in lines 10 to 14 that “a long-term reduction in surface discharge at perennial surface water source areas is likely to occur in some areas even after implementation of the SNWA proposed adaptive management measures and proposed mitigation measures,” and that such reduction in surface discharge is considered “an unavoidable adverse impact” associated with the proposed groundwater development. In light of the NPS’s legal directive to protect park natural resources “unimpaired for the enjoyment of future generations,” the NPS respectfully requests that additional evaluation and discussion be provided in the final EIS to assess the potential effectiveness of these two adaptive management measures at avoiding adverse impacts to NPS water resources. This can be easily accomplished preliminarily by comparing the current modeling results for the Proposed Action and selected alternative pumping scenarios. Conclusions on the effectiveness of these mitigation measures should be based on model simulation results and not solely on professional judgment.	Thank you for your comment. Please see Standard Resource Responses MM-1 and MM-2. See also Sections 3.3 (water) and 3.20 for an analysis of groundwater pumping and impact mitigation.
34679-149	The current regional groundwater flow model, even with its flaws, limitations and uncertainties, provides the only predictive tool for evaluating the potential effectiveness of these two adaptive management measures, and should be utilized more fully by the BLM. For example, comparison of the current modeling results for the full build-out plus 200 years period for the Proposed Action (pumping 177,000 afy from many geographically distributed points of diversion) with the modeling results for Alternative B (pumping 177,000 afy at a limited number of original points of diversion) strongly suggests that implementation of geographic redistribution of groundwater withdrawals by itself in Spring Valley and Snake Valley will not be effective at avoiding adverse impacts to Great Basin National Park’s water resources and other resources in these valleys. While distributing pumping in both valleys has some positive effect on reducing the magnitude of the drawdown impacts, the magnitude of drawdown is still substantial, more widely extensive, and is just as likely to adversely affect the park’s water resources in Snake Valley. Furthermore, the ability to redistribute pumping is greatly constrained in Snake Valley, given the smaller amount of available space located within the Nevada portion of the valley, which hampers the effectiveness of this mitigation measure, as well as the implementation of early-warning monitoring in Snake Valley. Geographic re-distribution of pumping in Spring Valley and Snake Valley also has the negative tradeoff of further reducing groundwater discharge to ET areas in both valleys. Comparison of the results for the Proposed Action with Alternative B indicates that the percent reduction in groundwater discharge to ET increases from 73% to 84% in Spring Valley and from 24% to 33% in Snake Valley for the full build-out plus 200 years period, as a result of geographically re-distributing the same amount of pumping in both valleys under the Proposed Action. This further reduction in ET discharge will likely have indirect effects on phreatophytic vegetation in these areas and possibly indirect effects on air quality due to increased fugitive dust emissions originating off of desiccated ET areas. Another negative trade-off of geographic re-distribution of pumping could be increased impacts to surface water rights and groundwater rights, as demonstrated by a comparison of the model simulation results for the Proposed Action and Alternative B.	Thank you for your comment.
34679-150	The NPS respectfully requests that additional evaluation and discussion be provided in subsections 3.3.2.9 through 3.3.2.14 in the final EIS focusing on comparing the current modeling results for the Proposed Action and the different alternative pumping scenarios in an attempt to better ascertain whether or not it is reasonable to expect these two adaptive management measures to be effective at avoiding adverse impacts to the water resources at Great Basin National Park and other federal and private lands. Suggested additional comparisons of results the NPS would like to see discussed include: • Comparison of Proposed Action results (pumping 177,000 afy at many geographically distributed points of diversion) with Alternative A results (pumping 115,000 afy at many geographically distributed points of diversion) and with Alternative C results (pumping an average of 62,000 afy throughout the simulation periods at many geographically distributed points of diversion) to evaluate the effectiveness of implementing a reduction or cessation in groundwater withdrawals; • Comparison of Alternative B results (pumping 177,000 afy at the original points of diversion) with Alternative A results (pumping 115,000 afy at many geographically distributed points of diversion) and with Alternative C results (pumping an average of 62,000 afy throughout the simulation periods at many geographically distributed points of diversion) to evaluate the effectiveness of the combined implementation of geographic re-distribution of groundwater withdrawals and reduction / cessation in groundwater withdrawals; and• Comparison of Alternative B results (pumping 177,000 afy at the original points of diversion) with Alternative D results and Alternative E results (pumping 79,000 afy at many geographically distributed points of diversion with no pumping in Snake Valley) to evaluate the effectiveness of the combined implementation of geographic redistribution of groundwater withdrawals, reduction in groundwater withdrawals, and avoidance of pumping in sensitive areas.	See response WR-8 regarding the request to provided additional impact descriptions and comparisons in the FEIS; and response MM-1 regarding monitoring and mitigation. The discussion of potential residual adverse effects is provided in qualitative terms. The BLM anticipates that additional analysis of the potential impacts and effectiveness of mitigation measures would likely be provided in subsequent NEPA documents related to development of groundwater development areas.

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ID	Comment	Response
34679-151	If necessary, additional model simulations should be conducted further testing the potential effectiveness of these two adaptive management approaches under each scenario. If this preliminary comparative analysis shows that adverse impacts to the park's water resources cannot be avoided using these measures, then the water resources and other water-dependent resources in the park cannot remain "unimpaired for the enjoyment of future generations," which is unacceptable to the NPS. In such a case, the NPS feels the BLM should consider an alternative to the Proposed Action that clearly demonstrates avoidance of adverse impacts to the park's water resources in the first place or after these proposed adaptive management approaches are applied.	See response WR-8 regarding the request to provided additional impact descriptions and comparisons in the FEIS; and response MM-1 regarding monitoring and mitigation. The discussion of potential residual adverse effects is provided in qualitative terms. The BLM anticipates that additional analysis of the potential impacts and effectiveness of mitigation measures would likely be provided in subsequent NEPA documents related to development of groundwater development areas.
34679-152	As noted in the previous comment, the BLM recognizes that reduction or cessation of pumping may be ineffective since recovery of water levels in specific areas of interest to pre-project conditions could take several years or decades and may not successfully mitigate long-term impacts to surface water resources in the area. Since the BLM only conducted the recovery analysis for one of the alternative pumping scenarios, it is unclear from the discussion to what degree the BLM believes the water level recovery observations are applicable to the other alternative pumping scenarios. The NPS respectfully requests that the BLM address this issue in the final EIS in subsequent discussions presented for the other alternative pumping scenarios by either extrapolating these recovery results to the other pumping scenarios or conducting individual water level recovery analyses for each alternative pumping scenario and discussing the results accordingly. At present, the mentioning of the recovery results is constrained to the discussion of the results for the Proposed Action and is ignored elsewhere in subsequent discussions about the other alternative pumping scenarios.	The discussion of potential residual impacts provided under the proposed action discusses a hypothetical case of ceasing pumping after a period of time and simulating the recovery of water levels. This hypothetical test case was provided in Appendix F3.3.5 and indicates that recovery after an extended period of pumping could take years or decades after the pumping ceases. The water resources impact evaluation for each of the project pumping alternatives refers back to the discussions provided under the Proposed Action regarding unavoidable residual impacts. The results of this hypothetical recovery simulation are relevant to all of the GWD pumping alternatives in general terms to disclose that recovery would take an extended period of time if pumping ceases. However, the Proposed Action and the other alternative pumping scenarios do not include cessation of pumping. Therefore, there is no basis for simulating an arbitrary cessation of pumping and allowing the system to recover for each of the seven GWD pumping scenarios as suggested in the comment.
34679-153	An incorrect reference of 54.7 miles is made to the total length of perennial stream reaches that could be affected by construction activities in the groundwater development areas. Please correct this reference to 29 miles (see Table 3.3.2-5).	The number in the text was corrected.
34679-154	In the fourth paragraph under the minor subheading titled Impacts to Water Levels, the NPS respectfully suggests that the BLM provide additional language to the discussion indicating the total area (miles squared) encompassed by the 10-foot drawdown contour for the Alternative A model simulation. This additional information will help the reader to more fully understand the size of the affected area, beyond just describing the general dimensions of the drawdown area.	The drawdown areas for all alternatives at the representative timeframes is shown on the series of maps provided in Section 3.3.2 and in Appendix F3.3. Quantification of the square miles of drawdown is not relevant to the description of potential impact of water resources since the impact assessment is based on determining the relative risk to water resources based on the projected drawdowns combined with the general geomorphic setting, geology, and depth to groundwater as described in Section 3.3.8.
34679-155	In the last paragraph under the minor subheading titled Impacts to Water Levels, the NPS respectfully requests that the BLM provide the additional language "and Alternative B" to the end of the last sentence in this paragraph. The addition of this language more accurately reflects the reality of the simulation results presented in the draft EIS, since the amount of pumping under the Proposed Action and Alternative B are the same (177,000 afy) and therefore should produce similar amounts of drawdown.	This discussion is not intended to compare the results of Alternative A to Alternative B.
34679-156	In the second paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that additional language (presented in italics) be inserted in this paragraph as follows: "Potential total effects to perennial springs and streams are summarized in Table 3.3.2-9. Comparison of the results of the model simulations and the resource impact evaluation for the three representative time periods indicated that the number of springs and miles of perennial streams that potentially could be affected increases at each successive time period. For the predicted drawdown area at full build out plus 75 years, there are 29 inventoried springs and 86 "other" springs located within the high and moderate risk areas. By full build out plus 200 years, this increased to 46 inventoried springs and 136 "other" springs located within the high and moderate risk areas. These springs occur in Cave, Steptoe, Hamlin, Spring (HA 184), Snake, and Lake valleys. The greatest impact to these springs at the full build-out plus 200 year period occurs in Spring Valley (184) (24 inventoried, 65 other) and Snake Valley (14 inventoried, 59 other), with lesser impact occurring Lake Valley (4 inventoried, 7 other), Steptoe Valley (1 inventoried, 5 other), Hamlin Valley (2 inventoried), and Cave Valley (1 inventoried)." With respect to the proposed second sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for Alternative A. The simple revision to the last sentence allows the reader to see that pumping under Alternative A will likely result in proportionately greater impacts to Spring Valley and Snake Valley springs than the other affected valleys. This information exists in Table F3.3.9-2A (Appendix F3.3.9) and should be summarized and discussed accordingly. The NPS believes these changes are needed to provide balanced and consistent description of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-157	In the third paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that the BLM present additional discussion on which valleys experience the greatest impact to the perennial streams contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been overlooked or downplayed in the current discussion. This information exists in Table F3.3.11-2A (Appendix F3.3.11) and should be summarized and discussed accordingly. The NPS respectfully requests that the last sentence in this paragraph be revised as follows to address this issue: "The greatest impact to perennial streams at the full build-out plus 200 year period occurs in Snake Valley (60 miles) and Spring Valley (184) (15 miles), with lesser impact occurring in Steptoe Valley (4 miles), and Lake Valley (1 mile)." This simple revision allows the reader to see that pumping under Alternative A will likely result in proportionately greater impacts to Snake Valley and Spring Valley perennial streams than the other affected valleys.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-158	In the second paragraph under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the NPS respectfully requests that this paragraph by revised with additional text (presented in italics) to read as follows: "In the Great Salt Lake Desert Flow System, spring discharge was simulated at 3 springs in Spring Valley, and 4 springs in Snake Valley. In Spring Valley, the model simulations indicate that by full build out plus 75 years, the flow at Keegan, North Millick, and South Millick Springs all show small to moderate reductions of flow (9 to 28 percent). At full build out plus 200 years these springs are predicted to experience flow reductions ranging from 11 to 36 percent. These three springs are all located near the margin of the valley floor in the north central portion of the valley. These results, coupled with the drawdown results in Spring Valley, suggest that springs located in the southern portion of the valley that are hydraulically connected to the regional flow system are likely to experience moderate to substantial reductions in flow over the long term, with the strong likelihood of some springs drying up. In Snake Valley, the model indicated that measurable flow reductions (>5 percent) are not anticipated at Foote Reservoir Springs, Kell Springs, and Gandy Warm Springs located in the central portion of the basin. Big Springs located in the southern portion of the basin is predicted to experience a substantial reduction in flow by the full build out plus 75 years time frame. Reductions of flow at Big Springs would substantially reduce flows in Big Springs Creek and flows to Lake Creek and into Pruess Lake. The results suggest that the springs located on the valley floor in the southern portion of the valley likely would experience substantial reductions in flow, with the strong likelihood of many springs drying up. This outcome is further supported by the observation that Needle Point Spring, located northeast of Big Springs in Utah, dried up in response to comparatively smaller agricultural pumping in the area." The NPS believes these additional text revisions provide a more balanced interpretation and consistent discussion of the likely impacts that will befall many of the springs in Spring Valley and Snake Valley, based on the results presented in the draft EIS for Alternative A. Additionally, statements such as "results are essentially the same as those described for the Proposed Action" make it difficult for the reader to readily understand the relative impact of Alternative A compared to the Proposed Action without the reader re-acquainting themselves with the similar discussion presented for the Proposed Action. If the results are similar, the NPS suggests restating the discussion as it pertains to the results for Alternative A. The NPS also believes the additional text revisions provide a more balanced interpretation of the likely impacts that will befall many of the springs in the southern portions of Snake Valley. These additional text revisions are also supported by the fact that Big Springs appears to be located in the high-risk valley floor area (see Figures F3.3.8A-5 and F3.3.8A-6), where the BLM has identified that pumping-related impacts are likely to occur to perennial water resources that depend on flow from the regional groundwater flow system. Additionally, the fact that the BLM's own Needle Point Springs dried up 10 years ago due to comparatively smaller agricultural pumping in the area (see discussion on pages 3.3-24 and 3.3-25), strongly suggests that the much greater pumping under Alternative A will most likely substantially reduce or dry up many other springs in the southern portion of Snake Valley. This direct line of evidence should be included in the discussion and not ignored.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-159	In the first paragraph under the minor subheading titled Water Resources Within or Adjacent to GBNP, the NPS respectfully requests that the BLM include recognition in the discussion that 0.5 miles of Lehman Creek and its tributaries are located within the area of moderate risk by the full build-out plus 200 years period. This result is reported in Table 3.3.2-8 for Alternative A and should be acknowledged in the discussion. Additionally, in the second to last sentence and the last sentence of the first paragraph, the discussion compares the results for Alternative A with the Proposed Action. Please compare the results for Alternative A with the Proposed Action and Alterative B, since the amount of pumping under the Proposed Action and Alternative B are the same (177,000 afy) and therefore should produce similar effects.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-160	In the discussion under the minor subheading titled Utah Surface Water Resources, the NPS respectfully requests that the BLM provide additional discussion about possible impacts to water supply wells in Pine Valley resulting from pumping under Alternative A. Given that predicted drawdown at the model boundary between Snake Valley and Pine Valley is on the same order of magnitude as the Proposed Action, there should be similar relevant discussion on the potential impacts to water supply wells in this valley, as was presented for the Proposed Action.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

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ID	Comment	Response
34679-161	In the discussion under the minor subheading titled Impacts to Surface Water Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in surface water rights impacts over time and which valleys experience the greatest impact to surface water rights contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been neglected or downplayed in the current discussion. This information exists in Table F3.3.13-2A (Appendix F3.3.13) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) to be added to this paragraph to address these issues: "The locations and manner of use of the active surface water rights within the drawdown area at full build out and full build out plus 75 years and full build out plus 200 years are presented in Figures F3.3.12A-4, F3.3.12A-5, and F3.3.12A-6, respectively in Appendix F3.3.12. Table F3.3.13-2A (Appendix F3.3.13) lists the number of active surface water rights within the drawdown area that occur within the high-, moderated-, and low-risk areas at the three representative time frames. These results indicate that the number of surface water rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years there are a total of 109 surface water rights located in areas where there is a moderate to high risk of impacts to surface flows. By the full build out plus 200 years time frame, there are 151 surface water right located in areas where there is a moderate to high risk of impacts to surface flows. The greatest impact to surface water rights at the full build-out plus 200 year period occurs in Spring Valley (184) (77 water rights) and Snake Valley (57 water rights), with lesser impact occurring in Lake Valley (7 water rights), Steptoe Valley (5 water rights), Hamlin Valley (3 water rights),and Cave Valley (2 water rights). For surface water rights that are dependent on groundwater discharge, a potential reduction in the water table at the point of diversion, could reduce or eliminate the flow available at the point of diversion for the surface water right." With respect to the proposed third sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for Alternative A. The proposed second to last sentence allows the reader to see that pumping under Alternative A will likely result in proportionately greater impacts to Spring Valley and Snake Valley surface water rights than the other affected valleys.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

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ID	Comment	Response
34679-162	In the discussion under the minor subheading titled Impacts to Groundwater Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in groundwater rights impacts over time, which valleys experience the greatest impact to groundwater rights contained in the affected valleys at the full build-out plus 200 year period, and what impacts are anticipated in the area of Shoshone Ponds. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been neglected or downplayed in the current discussion. This information exists in Table F3.3.15-2A (Appendix F3.3.15) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) be added to this discussion to address these issues: "Figures F3.3.14A-4, F3.3.14A-5, and F3.3.14A-6 in Appendix F3.3.14 illustrate the location and manner of use of existing groundwater rights in relation to the magnitude of the model-simulated drawdown at full build out and at full build out plus 75 years and full build out plus 200 years. Table F3.3.15-2A (Appendix F3.3.15) lists the groundwater rights by hydrographic basin within the drawdown area. These results indicate that the number of groundwater rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years, there are 174 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. At full build out plus 200 years, the number increases to 223 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. The greatest impact to groundwater rights that experience a predicted drawdown of at least 10 feet at the full buildout plus 200 year period occurs in Snake Valley (111 water rights) and Spring Valley (184) (65 water rights), with lesser impact occurring in Lake Valley (23 water rights), Hamlin Valley (10 water rights), Cave Valley (7 water rights), Dry Lake Valley (6 water rights), and Delamar Valley (1 water right). It should be noted that the greatest magnitude of drawdown impact will occur in Snake Valley, where 77 out the 111 water rights could experience drawdown greater than 50 feet. The potential impacts to individual wells are the same as discussed under the Proposed Action. The predominant beneficial uses for the active groundwater rights within the drawdown area at full build out plus 200 years are irrigation and stockwatering. Additional beneficial uses associated with water rights that could be affected include commercial, mining and milling, municipal, domestic, and wildlife. Impacts to wells could include a reduction in yield, increased pumping cost, or if the water level were lowered below the pump setting or the bottom of the well, the well could be rendered unusable. Actual impacts to the artesian water source at the Shoshone Ponds area in southern Spring Valley would depend on the interconnection between the aquifer that sustains flow in the artesian well and the aquifers developed for production from proposed well field development. Considering the simulated drawdown under Alternative A and the hydrogeologic setting, there is a high risk that well field pumping could eventually result in reducing or drying up artesian flows that sustain Shoshone Ponds." With respect to the proposed third sentence of the first paragraph, this same trend observation was noted in the similar results under the Proposed Action and is also applicable to the results presented for Alternative A. The proposed last sentence of the first paragraph allows the reader to see that pumping under the Alternative A will likely result in proportionately greater impacts to Snake Valley and Spring Valley groundwater rights than the other affected valleys. Lastly, the proposed second and third paragraphs of this discussion are a paraphrasing of the discussion presented for these topics under the Proposed Action. If the results are similar, the NPS suggests restating the discussion as it pertains to the results for Alternative A. The NPS believes these changes are needed to provide a balanced and consistent description of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-163	In the first paragraph under the minor subheading titled Impacts to Water Balance, the NPS respectfully requests that this paragraph by revised with additional text (presented in italics) to read as follows: "The model-simulated groundwater budget for the Alternative A pumping scenario is presented in Appendix F3.3.16, Table F3.3.16-2B. Compared to the simulated conditions under No Action, for Spring Valley, the Alternative A pumping is estimated to result in considerable reductions of groundwater discharge for ET of 51 percent at full build out plus 75 years and 57 percent at full build out plus 200 years time frame. In Snake Valley, the pumping is estimated to result in moderate reductions of groundwater discharge to support ET and spring discharge of 23 percent at full build out plus 75 years, and 27 percent at full build out plus 200 years with most of this reduction occurring in the southern portion of the valley. The proposed pumping is estimated to result in a moderate reduction of ET discharge from the portion of the Great Salt Lake Desert Flow System included within the study area of 34 percent at full build out plus 75 years and 39 percent at full build out plus 200 years. These predicted reductions in ET discharge rates indicate that spring discharge within and associated with these ET areas would be reduced. As with the Proposed Action, the Alternative A pumping is estimated to have minimal impact on ET discharge within the other pumping basins and the White River Flow System." The NPS believes these changes are needed to provide a balanced and consistent description of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

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ID	Comment	Response
34679-164	In the discussion under the subheading titled Potential Residual Impacts, the NPS respectfully requests that the BLM expand the discussion in the final EIS to refresh the reader's recollection of what potential unavoidable residual impacts to water resources are likely to occur under Alternative A. Furthermore, please provide additional evaluation and discussion focusing on comparing the current modeling results for Alternative A and the different alternative pumping scenarios in an attempt to better ascertain whether or not it is reasonable to expect whether the adaptive management measures of geographic re-distribution of pumping and cessation/ reduction of pumping will be effective at avoiding adverse impacts to the water resources at Great Basin National Park and other federal and private lands (see previous comments for page 3.3-121 & 3.3-122). Additionally, the NPS respectfully requests that the BLM address the likely effects that the water level recovery analysis presented in Appendix F3.3.5 will have on ameliorating these unavoidable residual impacts (see previous comments for page 3.3-122, lines 7-10).	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-165	In the second paragraph under the subheading titled Groundwater Development Areas, please revise the fourth sentence to recognize that a total of 5.3 miles of the three perennial stream reaches could be affected by construction activities in the groundwater development areas (see Table 3.3.2-5).	The miles of stream was added to the sentence as requested in the comment.
34679-166	In the fourth paragraph under the minor subheading titled Impacts to Water Levels, the NPS respectfully suggests that the BLM provide additional language to the discussion indicating the total area (miles squared) encompassed by the 10-foot drawdown contour for the Alternative B model simulation. This additional information will help the reader to more fully understand the size of the affected area, beyond just describing the general dimensions of the drawdown area.	The drawdown areas for all alternatives at the representative timeframes is shown on the series of maps provided in Section 3.3.2 and in Appendix F3.3. The methodology used to evaluate potential impacts to springs and streams is described in Section 3.3.2.8 of the EIS. Quantification of the square miles of drawdown is not relevant to the description of potential impact of water resources since the impact assessment is based on determining the relative risk to water resources based on the projected drawdowns combined with the general geomorphic setting, geology, and depth to groundwater as described in Section 3.3.8. The number of square miles within the drawdown cone does not equate to effects to water resource since the drawdown area includes mountainous upland areas which were determined to be areas where impacts to surface water resources are unlikely to occur.
34679-167	In the fourth paragraph under the minor subheading titled Impacts to Water Levels, the NPS respectfully requests that the last sentence of this paragraph by revised with additional text (presented in italics) to read as follows: "With the exception of Snake Valley where the drawdown at the observation wells is predicted to be essentially the same as the Proposed Action and Dry Lake Valley where drawdown exceeds the drawdown under the Proposed Action, the representative hydrographs illustrate that the groundwater withdrawal under the Alternative B pumping scenario is predicted to result in a reduction in the amount of drawdown within the pumping basins as compared to the Proposed Action at the selected observation wells for Spring, Cave, and Delamar, and Dry Lake valleys." Examination of the hydrograph for Dry Lake Valley (Figure 3.3.2-8) shows drawdown under Alternative B to be greater than that under the Proposed Action.	The text was modified for consistency with the referenced hydrographs.
34679-168	In the second paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that additional language (presented in italics) be inserted in this paragraph as follows: "Potential total effects to perennial springs and streams are summarized in Table 3.3.2-11. Comparison of the results of the model simulations and the resource impact evaluation for the three representative time periods indicated that the number of springs and miles of perennial streams that potentially could be affected increases at each successive time period. For the predicted drawdown area at full build out plus 75 years, there are 54 inventoried springs and 121 "other" springs located within the high and moderate risk areas. By full build out plus 200 years, this increased to 78 inventoried springs and 210 "other" springs located within the high and moderate risk areas. These springs occur in Cave, Steptoe, Hamlin, Spring (HA 184), Snake, and Lake valleys. The greatest impact to these springs at the full build-out plus 200 year period occurs in Spring Valley (184) (26 inventoried, 121 other) and Snake Valley (42 inventoried, 66 other), with lesser impact occurring in Lake Valley (6 inventoried, 14 other), Steptoe Valley (1 inventoried, 7 other), Hamlin Valley (2 inventoried), and Cave Valley (1 inventoried, 2 other)." With respect to the proposed second sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for Alternative B. The simple revision to the last sentence allows the reader to see that pumping under Alternative B will likely result in proportionately greater impacts to Spring Valley and Snake Valley springs than the other affected valleys. This information exists in Table F3.3.9-3A (Appendix F3.3.9) and should be summarized and discussed accordingly. The NPS believes these changes are needed to provide a balanced and consistent description of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

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ID	Comment	Response
34679-169	In the third paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that the BLM present additional discussion on which valleys experience the greatest impact to the perennial streams contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been overlooked or downplayed in the current discussion. This information exists in Table F3.3.11-3A (Appendix F3.3.11) and should be summarized and discussed accordingly. The NPS respectfully requests that the last sentence in this paragraph be revised as follows to address this issue: "The greatest impact to perennial streams at the full build-out plus 200 year period occurs in Snake Valley (73 miles) and Spring Valley (184) (34 miles), with lesser impact occurring in Steptoe Valley (7 miles), and Lake Valley and Lower Meadow Valley Wash (3 miles each)." This simple revision allows the reader to see that pumping under the Alternative B will likely result in proportionately greater impacts to Snake Valley and Spring Valley (184) perennial streams than the other affected valleys.	Additional text was added for clarification. See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources. Also see response WR-1 regarding additional modeling.
34679-170	In the first paragraph under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the discussion notes that Butterfield Spring and Flag Springs 3 are predicted to experience flow reductions of 20 and 19 percent respectively by the full build-out time frame. The current discussion ignores the larger impact that will be experienced by the full build-out plus 75 years and full build-out plus 200 years time frames, which consistently have been the points of reference in the EIS. The NPS respectfully requests that the second sentence in this paragraph be revised as follows to address this issue: "The model results indicate that two of the modeled springs in White River Valley, Butterfield Spring and Flag Springs 3, are predicted to experience moderate flow reductions of 34 percent and 29 percent, respectively, at the full build out plus 75 years time frame, and flow reductions of 45 percent and 37 percent, respectively, at the full build out plus 200 years time frame." The NPS believes these changes are needed to provide a balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	Text revised in response to comment.
34679-171	In the second and third paragraphs under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the NPS respectfully requests that these paragraphs by revised with additional text (presented in italics) to read as follows: "In the Great Salt Lake Desert Flow System, spring discharge was simulated at 3 springs in Spring Valley, and 4 springs in Snake Valley. In Spring Valley, the model simulations indicate that by full build out plus 75 years, the flow at Keegan, North Millick, and South Millick Springs all show small to moderate reductions of flow (3 to 47 percent). At full build out plus 200 years these springs are predicted to experience small to substantial flow reductions ranging from 5 to 99 percent. These three springs are all located near the margin of the valley floor in the north central portion of the valley. These results, coupled with the drawdown results in Spring Valley, suggest that springs located in the southern portion of the valley that are hydraulically connected to the regional flow system are likely to experience substantial reductions in flow over the long term, with the strong likelihood of some springs drying up. In Snake Valley, the model indicated that measurable flow reductions (>5 percent) are not anticipated at Foote Reservoir Springs, Kell Springs, and Gandy Warm Springs located in the central portion of the basin. Big Springs located in the southern portion of the basin is predicted to experience a substantial reduction in flow by the full build out plus 75 years time frame. Reductions of flow at Big Springs would substantially reduce flows in Big Springs Creek and flows to Lake Creek and into Pruess Lake. The results suggest that the springs located on the valley floor in the southern portion of the valley likely would experience substantial reductions in flow, with the strong likelihood of many springs drying up. This outcome is further supported by the observation that Needle Point Spring, located a few miles northeast of Big Springs in Utah, dried up in response to comparatively smaller agricultural pumping in the area." The NPS believes these additional text revisions provide a more fair and balanced interpretation of the likely impacts that will befall many of the springs in Spring Valley and Snake Valley, based on the results presented in the draft EIS for Alternative B. Additionally, statements such as "results are essentially the same as those described for the Proposed Action" make it difficult for the reader to readily understand the relative impact of Alternative B compared to the Proposed Action without the reader reacquainting themselves with the similar discussion presented for the Proposed Action. If the results are similar, the NPS suggests restating the discussion as it pertains to the results for Alternative B. The NPS also believes the additional text revisions provide a balanced interpretation of the likely impacts that will befall many of the springs in the southern portions of Snake Valley. These additional text revisions are also supported by the fact that Big Springs appears to be located in the high-risk valley floor area (see Figures F3.3.8A- 8 and F3.3.8A-9), where the BLM has identified that pumping-related impacts are likely to occur to perennial water resources that depend on flow from the regional groundwater flow system. Additionally, the fact that the BLM's own Needle Point Springs dried up 10 years ago due to comparatively smaller agricultural pumping in the area (see discussion on pages 3.3-24 and 3.3-25), strongly suggests that the much greater pumping under Alternative B will most likely substantially reduce or dry up many other springs in the southern portion of Snake Valley. This direct line of evidence should be included in the discussion and not ignored.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

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ID	Comment	Response
34679-172	In the first paragraph under the minor subheading titled Water Resources Within or Adjacent to the GBNP, there is no mention in the discussion of the number of miles of perennial stream contained in the area of moderate risk. Since the pumping under Alternative B would appear to have the greatest impact on perennial streams in Great Basin National Park compared to the other alternative actions, the NPS respectfully requests that the following additional sentences be added to the discussion after the fifth sentence in this paragraph: "Model results indicate that at the full build out plus 75 years time frame, as much as 1.7 miles of Baker Creek, 2 miles of Lehman Creek, and 12.9 miles of Snake Creek could be impacted from project pumping. At the full build out plus 200 years time frame, the model predicts the potential impacts will increase, affecting as much as 2.6 miles of Baker Creek, 2.3 miles of Lehman Creek, and 15.1 miles of Snake Creek." The NPS believes this additional text provides a more balanced interpretation of the likely impacts that will befall many of the streams in Great Basin National Park, based on the results presented in the draft EIS for Alternative B. This additional discussion is important to give the reader additional context on which streams will suffer the greatest impact from the GWD project pumping, as this has been neglected or downplayed in the current discussion and is inconsistent with similar discussions for the Proposed Action and Alternative A, which described the number of miles of perennial streams in the park that would be affected. This information exists in Table 3.3.2-8 and should be summarized and discussed accordingly.	The requested additional detail (and comparison to other alternatives) is provided in Table 3.3.2-8 referenced in this paragraph. Also see Response WR-8.
34679-173	In the second paragraph under the minor subheading titled Water Resources Within or Adjacent to the GBNP, the NPS respectfully requests that this paragraph by revised with additional text (presented in italics) to read as follows: "Model simulations have been performed using the Snake Valley RASA GBNP model developed by Halford and Plume (2011) to evaluate the potential effects of groundwater pumping in Snake Valley. This model simulates groundwater pumping in Snake Valley and only considers pumping at the points of diversions specified in the water right applications, similar to Alternative B. The GBNP model also differs from the CCRP model in that it does not model selected faults in the area as discrete horizontal flow barrier structures as the CCRP model does. Instead, the GBNP model simulates the hydraulic effect of faults as the juxtapositioning of geologic formations with differing hydraulic properties against each other that commonly results from faulting, by assigning different permeabilities to selected geologic formations on both sides of a fault. While the treatment of fault structures and the amounts of water pumped at each point of diversion differ between the two model simulations, the comparison of results is still informative in helping to bracket the potential range of impacts predicted by the local-scale GBNP model and the regional-scale CCRP model. The model-simulated flow reductions from pumping at the points of diversions are summarized in Table 3.3.2-13. The GBNP model results indicate that 200 years after pumping is initiated, project pumping in Snake Valley at the points of diversions combined with irrigation pumping in the valley would substantially impact flows in Big Springs, Home Farm Springs, Kious Spring, Rowland Spring, and Spring Creek Spring, with the strong likelihood of several springs drying up; and would not affect flows in Twin Spring located north of the proposed groundwater development area; and would not affect flows in Fish Springs located in the Fish Springs Flat hydrographic basin." The NPS believes inclusion of this new language is critical to providing a fair differentiation of the GBNP model from the CCRP model to the reader, and provides a more balanced interpretation of the likely impacts that will befall many of the perennial water sources in Great Basin National Park from pumping under Alternative D. Differences in the results of both models may be partially related to how fault structures are treated in the models. Additionally, the NPS would like to reiterate that before issuing a decision on the pipeline ROWs, the GBNP model could be utilized to replicate the same pumping schemes (i.e., same points of diversion, pumping amounts, and durations) in Spring Valley and Snake Valley that were simulated for the Proposed Action and Alternatives A through E. Since the GBNP model is smaller in scale, it would provide better insight on localized impacts to water resources and water-dependent resource in these two valleys than the CCRP model currently provides since it is more regional in scale. Future modeling such as this would allow the BLM to compare the drawdown results in Spring Valley and Snake Valley from both models and better bracket the range of potential impacts to resources in Spring Valley, Snake Valley and especially Great Basin National Park for all of the alternatives being considered in this EIS. Such future modeling would meet the intent of the BLM's stated interest in "receiving comments and suggestions concerning the analysis of the Snake Valley portion of the proposed project and identification of impacts to resources in the area, especially to those in Great Basin National Park" (emphasis added).	The additional text was not added since (1) the intent of the summary provided in the referenced text from the EIS was to summarize the results and not describe the development of the model; and, (2) there are numerous differences in the modeling approach and the representation of faults is only one aspect. Highlighting this one aspect without explaining the other differences would not correctly represent the true differences in the model approach and model construction. The interested reader is referred to the model documentation that is incorporated by reference.

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ID	Comment	Response
34679-174	In the title of the Table 3.3.2-13, please revise the name of the model from Snake Valley RASA Model to GBNP Model, since the BLM originally gave this name to the model in earlier discussions. Additionally, please double-check the results presented in the table against the results presented in the recently updated report from Halford and Plume, 2011. In its review of the original results presented by the USGS for the GBNP model, the NPS identified some errors in the published results and reported them to the USGS. The USGS subsequently addressed the errors and republished an updated set of model results. It appears the BLM may not have been aware of this problem before publishing the draft EIS. The NPS advises the BLM to obtain the updated model results and double-check them against all of the results presented in Table 3.3.2-13. In particular, the results currently listed for Rowland Spring are known to be incorrect, as the updated results for the combined project pumping (50,000 afy) and irrigation pumping predict that Rowland Spring should experience reductions in flow of about 0%, 7%, 29%, 74%, and 100% at10 years, 25 years, 50 years, 100 years, and 200 years after the initiation of pumping. Results for just project pumping (50,000 afy) are very similar, indicating that the impact from existing irrigation pumping in the valley on water resources will be minimal compared to the GWD project pumping.	The reference to the model was modified for consistency in Section 3.2.. The results from the GBNP RASA model were checked and recalculate. The results provided in the DEIS with minor exceptions were correct. The updated numbers are provided in Table 3.3.2-13 in the FEIS. The values provided for Rowland Springs were correct in the DEIS and remain unchanged in the FEIS. These results represent the "L Run" (limited run) sets of results for the different scenarios provided in Appendix G in Halford and Plume, 2011. The results described in the comment were results from the "U Run" (unlimited run) which were not considered reasonable results as explained on p. 37 of this report, and therefore not used.
34679-175	In the discussion under the minor subheading titled Utah Surface Water Resources, the NPS respectfully requests that the BLM provide additional discussion about possible impacts to water supply wells in Pine Valley resulting from pumping under Alternative B. Given that predicted drawdown at the model boundary between Snake Valley and Pine Valley is very similar to the Proposed Action, there should be similar relevant discussion on the potential impacts to water supply wells in this valley, as was presented for the Proposed Action.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-176	In the discussion under the minor subheading titled Impacts to Surface Water Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in surface water rights impacts over time and which valleys experience the greatest impact to surface water rights contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been neglected or downplayed in the current discussion. This information exists in Table F3.3.13-3A (Appendix F3.3.13) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) to be added to this paragraph to address these issues: “The locations and manner of use of the active surface water rights within the drawdown area at full build out and full build out plus 75 years and full build out plus 200 years are presented in Figures F3.3.12A-7, F3.3.12A-8, and F3.3.12A-9, respectively in Appendix F3.3.12. Table F3.3.13-3A (Appendix F3.3.13) lists the number of active surface water rights within the drawdown area that occur within the high-, moderated-, and low-risk areas at the three representative time frames. These results indicate that the number of surface water rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years there are a total of 141 surface water rights located in areas where there is a moderate to high risk of impacts to surface flows. By the full build out plus 200 years time frame, there are 186 surface water right located in areas where there is a moderate to high risk of impacts to surface flows. The greatest impact to surface water rights at the full build-out plus 200 year period occurs in Spring Valley (184) (87 water rights) and Snake Valley (64 water rights), with lesser impact occurring in Lake Valley (21 water rights), Steptoe Valley (6 water rights), Hamlin Valley and Cave Valley (3 water rights each), and Patterson Valley and Lower Meadow Valley Wash (1 water right each). For surface water rights that are dependent on groundwater discharge, a potential reduction in the water table at the point of diversion, could reduce or eliminate the flow available at the point of diversion for the surface water right.” With respect to the proposed third sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for Alternative B. The proposed second to last sentence allows the reader to see that pumping under Alternative B will likely result in proportionately greater impacts to Spring Valley and Snake Valley surface water rights than the other affected valleys. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

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ID	Comment	Response
34679-177	In the discussion under the minor subheading titled Impacts to Groundwater Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in groundwater rights impacts over time, which valleys experience the greatest impact to groundwater rights contained in the affected valleys at the full build-out plus 200 year period, and what impacts are anticipated in the area of Shoshone Ponds. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been neglected or downplayed in the current discussion. This information exists in Table F3.3.15-3A (Appendix F3.3.15) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) be added to this discussion to address these issues: "Figures F3.3.14A-7, F3.3.14A-8, and F3.3.14A-9 in Appendix F3.3.14 illustrate the location and manner of use of existing groundwater rights in relation to the magnitude of the model-simulated drawdown at full build out and at full build out plus 75 years and full build out plus 200 years. Table F3.3.15-3A (Appendix F3.3.15) lists the groundwater rights by hydrographic basin within the drawdown area. These results indicate that the number of groundwater rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years, there are 184 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. At full build out plus 200 years, the number increases to 301 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. The greatest impact to groundwater rights that experience a predicted drawdown of at least 10 feet at the full buildout plus 200 year period occurs in Snake Valley (110 water rights) and Lake Valley (103 water rights), with lesser impact occurring in Spring Valley (184) (59 water rights), Hamlin Valley (11 water rights), Cave Valley (7 water rights), Dry Lake Valley (6 water rights), and Delamar Valley (1 water right). It should be noted that the greatest magnitude of drawdown impact will occur in Spring Valley, where 40 out the 59 water rights could experience drawdown greater than 100 feet. The potential impacts to individual wells are the same as discussed under the Proposed Action. The predominant beneficial uses for the active groundwater rights within the drawdown area at full build out plus 200 years are irrigation and stockwatering. Additional beneficial uses associated with water rights that could be affected include commercial, mining and milling, municipal, domestic, and wildlife. Impacts to wells could include a reduction in yield, increased pumping cost, or if the water level were lowered below the pump setting or the bottom of the well, the well could be rendered unusable. Actual impacts to the artesian water source at the Shoshone Ponds area in southern Spring Valley would depend on the interconnection between the aquifer that sustains flow in the artesian well and the aquifers developed for production from proposed well field development. Considering the simulated drawdown under Alternative B and the hydrogeologic setting, there is a high risk that well field pumping could eventually result in substantially reducing or drying up artesian flows that sustain Shoshone Ponds." With respect to the proposed third sentence of the first paragraph, this same trend observation was noted in the similar results under the Proposed Action and is also applicable to the results presented for Alternative B. The proposed last two sentences of the first paragraph allows the reader to see that pumping under Alternative B will likely result in proportionately greater impacts to Snake Valley and Lake Valley groundwater rights than the other affected valleys, and that the greatest magnitude of impact to groundwater rights will be felt in Spring Valley. Lastly, the proposed second and third paragraphs of this discussion are a paraphrasing of the discussion presented for these topics under the Proposed Action. If the results are similar, the NPS suggests restating the discussion as it pertains to the results for Alternative B. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-178	In the first paragraph under the minor subheading titled Impacts to Water Balance, the NPS respectfully requests that this paragraph by revised with additional text (presented in italics) to read as follows: "The model-simulated groundwater budget for the Alternative B pumping scenario is presented in Appendix F3.3.16, Table F3.3.16-3B. Compared to the simulated conditions under No Action, for Spring Valley, the pumping is estimated to result in considerable reductions of groundwater discharge for ET of 66 percent at full build out plus 75 years and 73 percent at full build out plus 200 years. In Snake Valley, the pumping is estimated to result in moderate reductions of groundwater discharge to support ET and spring discharge of 18 percent at full build out plus 75 years, and 24 percent at full build out plus 200 years with most of this reduction occurring in the southern portion of the valley. The proposed pumping is estimated to result in a moderate reduction of ET discharge from the portion of the Great Salt Lake Desert Flow System included within the study area of 37 percent at full build out plus 75 years and 44 percent at full build out plus 200 years. These predicted reductions in ET discharge rates indicate that spring discharge within and associated with these ET areas would be reduced. Alternative B pumping is estimated to have minimal impact (5 percent or less) on ET discharge within the other pumping basins and the White River Flow System." The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-179	In the discussion under the subheading titled Potential Residual Impacts, the NPS respectfully requests that the BLM expand the discussion in the final EIS to refresh the reader's recollection of what potential unavoidable residual impacts to water resources are likely to occur under Alternative B. Furthermore, please provide additional evaluation and discussion focusing on comparing the current modeling results for Alternative B and the different alternative pumping scenarios in an attempt to better ascertain whether or not it is reasonable to expect that the adaptive management measures of geographic re-distribution of pumping and cessation/ reduction of pumping will be effective at avoiding adverse impacts to the water resources at Great Basin National Park and other federal and private lands (see previous comments for page 3.3-121 & 3.3-122). In the brief discussion about the comparative residual impacts between Alternative B and the Proposed Action, the BLM statement that "distributed pumping included in the Proposed Action would likely reduce impacts to springs and perennial streams with sensitive resources" is not supported by any additional evaluation or discussion of existing data. Comparison of results for Alternative B and the Proposed Action presented in Table 3.3.2- 22 suggest that while fewer perennial springs and streams may be affected under the Proposed Action compared to Alternative B (presumably due to implementing distributed pumping), these comparative results also reveal several negative tradeoffs that might result from instituting distributed pumping under the Proposed Action, including an increase in the number of affected surface water and groundwater rights, and a greater reduction in groundwater discharge to ET. This is the kind of additional evaluation and discussion of the results that is needed in the final EIS to ascertain how effective the adaptive management measures of geographic re-distribution of pumping and cessation/ reduction of pumping will be in the project basins and what tradeoffs there might be. Finally, the NPS respectfully requests that the BLM address the likely effects that the water level recovery analysis presented in Appendix F3.3.5 will have on ameliorating these unavoidable residual impacts (see previous comments for page 3.3-122, lines 7-10).	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-180	In the second paragraph under the minor subheading titled Groundwater Development Areas, the NPS respectfully requests that the second sentence in this paragraph by revised with additional text (presented in italics) to read as follows: "This includes 23 perennial stream reaches (total length of 20.2 miles) located in Spring Valley and 5 reaches (total length of 8.8 miles) located in Snake Valley." The NPS believes it is important to note the total stream length in both valleys so that the reader can better understand the relative degree of impact in each valley.	The requested additional detail (and comparison to other alternatives) is provided in Table 3.3.2-8 referenced in this paragraph. Also see Response WR-8.
34679-181	In the third paragraph under the minor subheading titled Impacts to Water Levels, the NPS respectfully suggests that the BLM provide additional language to the discussion indicating the total area (miles squared) encompassed by the 10-foot drawdown contour for the Alternative C model simulation. This additional information will help the reader to more fully understand the size of the affected area.	The drawdown areas for all alternatives at the representative timeframes is shown on the series of maps provided in Section 3.3.2 and in Appendix F3.3. The methodology used to evaluate potential impacts to springs and streams is described in Section 3.3.2.8 of the EIS. Quantification of the square miles of drawdown is not relevant to the description of potential impact of water resources since the impact assessment is based on determining the relative risk to water resources based on the projected drawdowns combined with the general geomorphic setting, geology, and depth to groundwater as described in Section 3.3.8. The number of square miles within the drawdown cone does not equate to effects to water resource since the drawdown area includes mountainous upland areas which were determined to be areas where impacts to surface water resources are unlikely to occur.
34679-182	In the second paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that additional language (presented in italics) be inserted in this paragraph as follows: "Potential total effects to perennial springs and streams are summarized in Table 3.3.2-14. Comparison of the results of the model simulations and the resource impact evaluation for the three representative time periods indicated that the number of springs and miles of perennial streams that potentially could be affected increases at each successive time period. For the predicted drawdown area at full build out plus 75 years, there are 19 inventoried springs and 44 "other" springs located within the high and moderate risk areas. By full build out plus 200 years, this increased to 26 inventoried springs and 70 "other" springs located within the high and moderate risk areas. These springs occur in Hamlin, Spring (HA 184) and Snake valleys. The greatest impact to these springs at the full build-out plus 200 year period occurs in Snake Valley (10 inventoried, 45 other) and Spring Valley (184) (15 inventoried, 25 other), with lesser impact occurring in Hamlin Valley (1 inventoried)." With respect to the proposed second sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for Alternative C. The simple revision to the last sentence allows the reader to see that pumping under Alternative C will likely result in proportionately greater impacts to Snake Valley and Spring Valley springs than the other affected valleys. This information exists in Table F3.3.9-4A (Appendix F3.3.9) and should be summarized and discussed accordingly. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-183	In the third paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that the BLM present additional discussion on which valleys experience the greatest impact to the perennial streams contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been downplayed in the current discussion. This information exists in Table F3.3.11-4A (Appendix F3.3.11) and should be summarized and discussed accordingly. The NPS respectfully requests that the last sentence in this paragraph be revised as follows to address this issue: "The greatest impact to perennial streams at the full build-out plus 200 year period occurs in Snake Valley (54 miles), with lesser impact occurring in Spring Valley (184) (5 miles)." This simple revision allows the reader to see that pumping under the Alternative C will likely result in proportionately greater impacts to Snake Valley perennial streams than the other affected valleys.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-184	In the second paragraph under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the NPS respectfully requests that this paragraph by revised with additional text (presented in italics) to read as follows: "In the Great Salt Lake Desert Flow System, spring discharge was simulated at 3 springs in Spring Valley, and 4 springs in Snake Valley. In Spring Valley, the model simulations indicate that by full build out plus 75 years, the flow at Keegan, North Millick, and South Millick springs all show small reductions of flow (5 to 14 percent). At full build out plus 200 years these springs are predicted to experience flow similar reductions ranging from 5 to 15 percent. These results, coupled with the drawdown results in Spring Valley, suggest that springs located in the southern portion of the valley that are hydraulically connected to the regional flow system are likely to experience small to moderate reductions in flow over the long term, with a lower probability of some springs drying up. In Snake Valley, the model simulation results are very similar to those described for the Proposed Action." "In Snake Valley, the model indicated that measurable flow reductions (>5 percent) are not anticipated at Foote Reservoir Springs, Kell Springs, and Gandy Warm Springs located in the central portion of the basin. Big Springs located in the southern portion of the basin is predicted to experience a substantial reduction in flow by the full build out plus 75 years time frame. Reductions of flow at Big Springs would substantially reduce flows in Big Springs Creek and flows to Lake Creek and into Pruess Lake. The results suggest that the springs located on the valley floor in the southern portion of the valley likely would experience substantial reductions in flow, with the strong likelihood of some springs drying up. This outcome is further supported by the observation that Needle Point Spring, located a few miles northeast of Big Springs in Utah, dried up in response to comparatively smaller agricultural pumping in the area." The NPS believes these additional text revisions provide a more fair and balanced interpretation of the likely impacts that will befall many of the springs in southern Snake Valley and Spring Valley, based on the results presented in the draft EIS for Alternative C. Additionally, statements such as "results are essentially the same as those described for the Proposed Action" make it difficult for the reader to readily understand the relative impact of Alternative C compared to the Proposed Action without the reader continually reacquainting themselves with the similar discussion presented for the Proposed Action. If the results are similar, the NPS suggests restating the discussion as it pertains to the results for Alternative C. The NPS also believes the additional text revisions provide a balanced interpretation of the likely impacts that will befall many of the springs in the southern portions of Snake Valley. These additional text revisions are also supported by the fact that Big Springs appears to be located in the high-risk valley floor area (see Figures F3.3.8A-11 and F3.3.8A-12), where the BLM has identified that pumping-related impacts are likely to occur to perennial water resources that depend on flow from the regional groundwater flow system. Additionally, the fact that the BLM's own Needle Point Springs dried up 10 years ago due to comparatively smaller agricultural pumping in the area (see discussion on pages 3.3-24 and 3.3-25), strongly suggests that the much greater pumping under Alternative C will most likely substantially reduce or dry up many other springs in the southern portion of Snake Valley. This direct line of evidence should be included in the discussion and not ignored.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-185	In the discussion under the minor subheading titled Utah Surface Water Resources, the NPS respectfully requests that the BLM provide additional discussion about possible impacts to water supply wells in Pine Valley resulting from pumping under Alternative C. Even though the predicted drawdown at the model boundary between Snake Valley and Pine Valley is smaller than the Proposed Action, there still should be similar relevant discussion on the potential impacts to water supply wells in this valley, as was presented for the Proposed Action. Additionally, in the first paragraph, why is there a reference to only two inventoried springs, when all previous similar discussions have referred to three inventoried springs?	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-186	In the discussion under the minor subheading titled Impacts to Surface Water Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in surface water rights impacts over time and which valleys experience the greatest impact to surface water rights contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been neglected or downplayed in the current discussion. This information exists in Table F3.3.13-4A (Appendix F3.3.13) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) to be added to this paragraph to address these issues: "The locations and manner of use of the active surface water rights within the drawdown area at full build out and full build out plus 75 years and full build out plus 200 years are presented in Figures F3.3.12A-10, F3.3.12A-11, and F3.3.12A-12, respectively in Appendix F3.3.12. Table F3.3.13-3A (Appendix F3.3.13) lists the number of active surface water rights within the drawdown area that occur within the high-, moderated-, and low-risk areas at the three representative time frames. These results indicate that the number of surface water rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years there are a total of 78 surface water rights located in areas where there is a moderate to high risk of impacts to surface flows. By the full build out plus 200 years time frame, there are 98 surface water right located in areas where there is a moderate to high risk of impacts to surface flows. The greatest impact to surface water rights at the full build-out plus 200 year period occurs in Spring Valley (184) (49 water rights) and Snake Valley (48 water rights), with lesser impact occurring in Hamlin Valley (1 water right). For surface water rights that are dependent on groundwater discharge, a potential reduction in the water table at the point of diversion, could reduce or eliminate the flow available at the point of diversion for the surface water right." With respect to the proposed third sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for Alternative C. The proposed second to last sentence allows the reader to see that pumping under Alternative C will likely result in proportionately greater impacts to Spring Valley and Snake Valley surface water rights than the other affected valleys. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-187	In the discussion under the minor subheading titled Impacts to Groundwater Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in groundwater rights impacts over time, which valleys experience the greatest impact to groundwater rights contained in the affected valleys at the full build-out plus 200 year period, and what impacts are anticipated in the area of Shoshone Ponds. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been neglected or downplayed in the current discussion. This information exists in Table F3.3.15-4A (Appendix F3.3.15) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) be added to this discussion to address these issues: "Figures F3.3.14A-10, F3.3.14A-11, and F3.3.14A-12 in Appendix F3.3.14 illustrate the location and manner of use of existing groundwater rights in relation to the magnitude of the model-simulated drawdown at full build out and at full build out plus 75 years and full build out plus 200 years. Table F3.3.15-3A (Appendix F3.3.15) lists the groundwater rights by hydrographic basin within the drawdown area. These results indicate that the number of groundwater rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years, there are 133 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. At full build out plus 200 years, the number increases to 171 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. The greatest impact to groundwater rights that experience a predicted drawdown of at least 10 feet at the full buildout plus 200 year period occurs in Snake Valley (101 water rights) and Spring Valley (184) (46 water rights), with lesser impact occurring in Hamlin Valley (9 water rights), Cave Valley and Dry Lake Valley (6 water rights each), Lake Valley (2 water rights), and Delamar Valley (1 water right). It should be noted that the greatest magnitude of drawdown impact will occur in Snake Valley, where all of the effected water rights could experience drawdown of 10-50 feet. The potential impacts to individual wells are the same as discussed under the Proposed Action. The predominant beneficial uses for the active groundwater rights within the drawdown area at full build out plus 200 years are irrigation and stockwatering. Additional beneficial uses associated with water rights that could be affected include commercial, mining and milling, municipal, domestic, and wildlife. Impacts to wells could include a reduction in yield, increased pumping cost, or if the water level were lowered below the pump setting or the bottom of the well, the well could be rendered unusable. Actual impacts to the artesian water source at the Shoshone Ponds area in southern Spring Valley would depend on the interconnection between the aquifer that sustains flow in the artesian well and the aquifers developed for production from proposed well field development. Considering the simulated drawdown under Alternative C and the hydrogeologic setting, there is a moderate risk that well field pumping could eventually result in reducing or drying up artesian flows that sustain Shoshone Ponds." With respect to the proposed third sentence of the first paragraph, this same trend observation was noted in the similar results under the Proposed Action and is also applicable to the results presented for Alternative C. The proposed last two sentences of the first paragraph allows the reader to see that pumping under the Proposed Action will likely result in proportionately greater impacts to Snake Valley and Spring Valley groundwater rights than the other affected valleys, and that the greatest magnitude of impact to groundwater rights will be felt in Snake Valley. Lastly, the proposed second and third paragraphs of this discussion are a paraphrasing of the discussion presented for these topics under the Proposed Action. If the results are similar, the NPS suggests restating the discussion as it pertains to the results for Alternative C. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-188	In the first paragraph under the minor subheading titled Impacts to Water Balance, the NPS respectfully requests that this paragraph by revised with additional text (presented in italics) to read as follows: "The model-simulated groundwater budget for the Alternative C pumping scenario is presented in Appendix F3.3.16, Table F3.3.16-4B. Compared to the simulated conditions under No Action, for Spring Valley, the pumping is estimated to result in a 37 percent reduction of groundwater discharge for ET at the full build out plus 75 years and full build out plus 200 years time frame. In Snake Valley, the pumping is estimated to result in small reductions of groundwater discharge to support ET and spring discharge of 15 percent at full build out plus 75 years, and 17 percent at full build out plus 200 years with most of this reduction occurring in the southern portion of the valley. The proposed pumping is estimated to result in a moderate reduction of ET discharge from the portion of the Great Salt Lake Desert Flow System included within the study area of 24 percent at full build out plus 75 years and 25 percent at full build out plus 200 years. These predicted reductions in ET discharge rates indicate that spring discharge within and associated with these ET areas would be reduced. Alternative C pumping is estimated to have minimal impact (1 percent or less) on ET discharge within the White River Flow System." The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-189	In the discussion under the subheading titled Potential Residual Impacts, the NPS respectfully requests that the BLM expand the discussion in the final EIS to refresh the reader's recollection of what potential unavoidable residual impacts to water resources are likely to occur under Alternative C. Furthermore, please provide additional evaluation and discussion focusing on comparing the current modeling results for Alternative C and the different alternative pumping scenarios in an attempt to better ascertain whether or not it is reasonable to expect the adaptive management measures of geographic re-distribution of pumping and cessation / reduction of pumping will be effective at avoiding adverse impacts to the water resources at Great Basin National Park and other federal and private lands (see previous comments for page 3.3-121 & 3.3-122). In the brief discussion about the comparative residual impacts between Alternative C and the Proposed Action, the BLM's statement that "the magnitude of the potential unavoidable residual impacts to water resources associated with the Alternative C pumping scenario would be substantially less than the Proposed Action and Alternatives A and B" is not substantiated by any additional evaluation or discussion of existing data. Additional evaluation and discussion of the results is needed in the final EIS to ascertain how effective the adaptive management measures of geographic redistribution of pumping and cessation/ reduction of pumping will be in the project basins at reducing these unavoidable residual impacts and what tradeoffs there might be. Finally, the NPS respectfully requests that the BLM address the likely effects that the water level recovery analysis presented in Appendix F3.3.5 will have on ameliorating these unavoidable residual impacts (see previous comments for page 3.3-122, lines 7-10). Since Alternative C is essentially demonstrating the mitigation concept of regular reduction or relaxation of pumping with its cyclical pumping scheme, the progressive expansion and deepening of drawdown over time in the project basins suggests that the pumping impacts created during the 5-year periods where pumping is maximized still counteract or overwhelm any positive water level recovery that is achieved during the 5-year periods where pumping is significantly curtailed. This further suggests that pumping water from these basins as a means of periodic drought relief still presents the potential for substantial threats to water resources and water-dependent resources in these basins.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-190	In the fourth paragraph under the minor subheading titled Impacts to Water Levels, the NPS respectfully requests that the BLM provide additional language to the discussion indicating the total area (miles squared) encompassed by the 10-foot drawdown contour for the Alternative D model simulation. This additional information will help the reader to more fully understand the size of the affected area, beyond just describing the general dimensions of the drawdown area.	The drawdown areas for all alternatives at the representative timeframes is shown on the series of maps provided in Section 3.3.2 and in Appendix F3.3. The methodology used to evaluate potential impacts to springs and streams is described in Section 3.3.2.8 of the EIS. Quantification of the square miles of drawdown is not relevant to the description of potential impact of water resources since the impact assessment is based on determining the relative risk to water resources based on the projected drawdowns combined with the general geomorphic setting, geology, and depth to groundwater as described in Section 3.3.8. The number of square miles within the drawdown cone does not equate to effects to water resource since the drawdown area includes mountainous upland areas which were determined to be areas where impacts to surface water resources are unlikely to occur.
34679-191	In the fifth paragraph under the minor subheading titled Impacts to Water Levels, the NPS respectfully requests that the last sentence in this paragraph by revised with additional text (presented in italics) to read as follows: "As shown in Figure 3.3.2-7, this alternative would substantially reduce the drawdown area in Snake Valley in the vicinity of Baker compared to the Proposed Action, and Alternatives A, B and C." The proposed changes to the last sentence allows the reader to see that pumping under Alternative D will result in much smaller impacts to Snake Valley groundwater levels than the previously discussed pumping alternatives, as this has been overlooked or downplayed in the current discussion. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	Additional text added in response to the comment.

Comments and Responses - Federal Government

ID	Comment	Response
34679-192	In the second paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that additional language (presented in italics) be inserted in this paragraph as follows: "Potential total effects to perennial springs and streams are summarized in Table 3.3.2-16. Comparison of the results of the model simulations and the resource impact evaluation for the three representative time periods indicated that the number of springs and miles of perennial streams that potentially could be affected increases at each successive time period. For the predicted drawdown area at full build out plus 75 years, there are 13 inventoried springs and 28 "other" springs located within the high and moderate risk areas. By full build out plus 200 years this increased to 31 inventoried springs and 92 "other" springs located within the high and moderate risk areas. These springs occur in Cave Steptoe, Hamlin, Spring (HA 184), Snake, Lake, Spring (HA 201), and Patterson Valleys. The greatest impact to these springs at the full build-out plus 200 year period occurs in Spring Valley (184) (12 inventoried, 27 other), Lake Valley (7 inventoried, 20 other) and Snake Valley (6 inventoried, 18 other), with lesser impact occurring in, Spring Valley (201) (1 inventoried, 16 other), Patterson Valley (1 inventoried, 6 other), Steptoe Valley (1 inventoried, 5 other), Hamlin Valley (2 inventoried), and Cave Valley (1 inventoried). It is interesting to note that by concentrating pumping in the southern end of Spring Valley (184) and increasing the resulting magnitude of drawdown, Alternative D still has the least impact to perennial springs in Spring Valley (184) when compared to the Proposed Action and all of the other alternative pumping scenarios. This positive tradeoff is likely due to concentrating the pumping in an area of Spring Valley (184) where there are fewer perennial springs and thus avoiding the likelihood of impacting a greater number of springs in the valley." With respect to the proposed second sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for Alternative D. The simple revision to the last sentence, along with the two additional sentences, allows the reader to recognize that pumping under Alternative D will likely result in proportionately greater impacts to Spring Valley (184), Lake Valley and Snake Valley springs than the other affected valleys, as well as recognize the unexpected positive tradeoff of fewer impacts to perennial springs in Spring Valley resulting from concentrating GWD pumping in the southern end of the valley. This information exists in Table F3.3.9-5A (Appendix F3.3.9) and should be summarized and discussed accordingly. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	A comparison of potential effects to surface water resources for the different alternatives is provided in Section 3.3.2.16 Summary and Comparison of Alternative pumping Scenarios. Specifically, Table 3.3.2-22 and Figure 3.3.2-40. These tables and figures provide a more complete comparison of the effects to water resources than adding additional text into the EIS. Also see response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-193	In the third paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that the BLM present additional discussion on which valleys experience the greatest impact to the perennial streams contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been overlooked or downplayed in the current discussion. This information exists in Table F3.3.11-5A (Appendix F3.3.11) and should be summarized and discussed accordingly. The NPS respectfully requests that the last sentence in this paragraph be revised and additional language be inserted (both presented in italics) as follows to address this issue: "The greatest impact to perennial streams at the full build-out plus 200 year period occurs in Snake Valley (26 miles) and Spring Valley (201) (11 miles), with lesser impact occurring in Steptoe Valley (4 miles), and Spring Valley (184) and Lake Valley (3 miles each). It is interesting to note that by concentrating pumping in the southern end of Spring Valley (184) and increasing the resulting magnitude of drawdown, Alternative D still has the least impact to perennial streams in Spring Valley (184) when compared to the Proposed Action and all of the other alternative pumping scenarios. This positive tradeoff is likely due to concentrating the pumping in an area of Spring Valley (184) where there are fewer perennial streams and thus avoiding the likelihood of impacting a greater number of streams in the valley." These additional revisions allows the reader to recognize that pumping under the Alternative D will likely result in proportionately greater impacts to Snake Valley and Spring Valley (201) perennial streams than the other affected valleys. An unexpected but important result that was overlooked by the BLM is that even by concentrating pumping in the southern end of Spring Valley (184), it still has the least impact on the number of perennial streams effected in the valley (3 miles) when compared to the results for the Proposed Action (38 miles), Alternative A (15 miles), Alternative B (34 miles), Alternative C (5 miles), and Alternatives E (15 miles). Even if Alternative D is not selected as the Preferred Alternative, the concentration of pumping in southern Spring Valley (184) and other project basins to avoid potential impacts to perennial streams in these basins potentially has relevance as a mitigation measure, which should be recognized and further evaluated in the final EIS.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-194	In the discussion under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the NPS respectfully requests that the BLM expand the discussion to refresh the reader how the results for Alternative D are similar to Alternative A and the Proposed Action, with respect to the discussion of the effects to the White River Flow System and the Great Salt Lake Desert Flow System. Again, statements such as “results are essentially the same as those described for the Proposed Action or Alternative A” make it difficult for the reader to readily understand the relative impact of Alternative D compared to the Proposed Action or Alternative A without the reader continually re-acquainting themselves with the similar discussion presented for the Proposed Action or Alternative A. If the results are similar, the NPS suggests restating the discussion as it pertains to the results for Alternative D. The NPS respectfully requests that the discussion under this subheading be replaced with the following discussion: “Model-simulated changes in spring flow for selected springs are presented in Table 3.3.2-17. The model results indicate that two of the modeled springs in White River Valley, Butterfield Spring and Flag Springs 3, are predicted to experience a 9 percent flow reduction at the full build out plus 200 years time frame. These results suggest that the groundwater development eventually could affect flows in springs located along the south eastern margin of the valley floor in White River Valley. The model results also indicate that other springs located in the northern portion of the valley floor in White River Valley, are unlikely to experience flow reductions (>5 percent) attributable to the Alternative D pumping. The model results indicate that measurable flow reductions attributable to this alternative are not anticipated in major regional spring discharge areas within the White River Flow System. In the Great Salt Lake Desert Flow System, spring discharge was simulated at 3 springs in Spring Valley and 4 springs in Snake Valley. In Spring Valley, the model simulations indicate that Alternative D would not impact flows at Keegan, North Millick, and South Millick springs. These three springs are all located near the margin of the valley floor in the north central portion of the valley. However, drawdown results suggest that springs located in the southern portion of the valley that are hydraulically connected to the regional flow system are likely to experience moderate to substantial reductions in flow over the long term, with the strong likelihood of some springs drying up. In Snake Valley, the model simulation results were used to evaluate potential changes in flow at Big Springs, Foote Reservoir Springs, Kell Spring, and Gandy Warm Springs. The model results indicated that measurable flow reductions (>5 percent) are not anticipated at Foote Reservoir Springs, Kell Springs, and Gandy Warm Springs located in the central portion of the basin. The results suggest that the springs located on the valley floor in the central and northern portion of the basin are unlikely to experience impacts (>5 percent flow reduction). Big Springs located in the southern portion of the basin is predicted to experience a substantial reduction in flow by the full build out plus 75 years time frame due to drawdown impacts spilling over into Snake Valley from pumping in southern Spring Valley. Reductions of flow at Big Springs would substantially reduce flows in Big Springs Creek and flows to Lake Creek and into Pruess Lake. The model results suggest that the springs located on the valley floor in the southern portion of the valley likely would experience substantial reductions in flow, with the strong likelihood of many springs drying up. This result also suggests that avoidance of pumping in Snake Valley coupled with the implementation of re-distributed and/or reduced pumping in Spring Valley under the Spring Valley stipulated agreement, might be the only measures that could prevent Big Springs and other springs in southern Snake Valley from experiencing large reductions in flow or drying up completely. This outcome is further supported by the observation that Needle Point Spring, located northeast of Big Springs in Utah, dried up in response to comparatively smaller agricultural pumping in the area.” The NPS believes these additional text revisions provide a more fair and balanced interpretation, and consistent discussion of the likely impacts that could befall many of the springs in southern Spring Valley and Snake Valley, based on the results presented in the draft EIS for Alternative D. In the case of Snake Valley, these additional text revisions are also supported by the fact that Big Springs appears to be located in the high-risk valley floor area (see Figures F3.3.8A-14 and F3.3.8A-15), where the BLM has identified that pumping-related impacts are likely to occur to perennial water resources that depend on flow from the regional groundwater flow system. Additionally, the fact that the BLM’s own Needle Point Springs dried up 10 years ago due to comparatively smaller agricultural pumping in the area (see discussion on pages 3.3-24 and 3.3-25), strongly suggests that the much greater pumping under Alternative D could substantially reduce or dry up other springs in the southern portion of Snake Valley. This direct line of evidence should be included in the discussion and not ignored.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources. Also see Section 3.20 and response MM-1 regarding BLM's proposed monitoring, management and mitigation plan for the GWD project.

Comments and Responses - Federal Government

ID	Comment	Response
34679-195	In the discussion under the minor subheading titled Water Resources Within or Adjacent to the GBNP, the NPS respectfully requests the BLM expand the discussion to refresh the reader how the results for Alternative D are similar to Alternative C by adding the following text to the end of the existing discussion: "At the full build out plus 75 years time frame there are no inventoried springs or perennial streams within the moderate risk zone. By the full build out plus 200 years time frame, Outhouse Spring (located approximately 2 miles outside the park boundary and 8 miles of Snake Creek and its tributaries are within the area of moderate risk. Potential risk to streams in caves systems are uncertain as discussed under the Proposed Action. However, it important to note that the simulated magnitude and extent of drawdown beneath and encroaching upon GBNP is less under Alternative D compared to the Proposed Action and Alternatives A and B. Therefore, if any perennial waters or waters in cave systems are hydraulically connected to the regional aquifer system affected by groundwater withdrawal, potential impacts to these water sources are anticipated to be less than those occurring under these alternatives." The NPS believes this additional text provides a more balanced interpretation and consistent discussion of the likely impacts that could befall many of the streams and cave features in Great Basin National Park, based on the results presented in the draft EIS for Alternative D. This additional discussion is important to give the reader additional context on the streams and cave features that could suffer the greatest impact from the GWD project pumping, as this has been overlooked or downplayed in the current discussion.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-196	In the discussion under the minor subheading titled Utah Surface Water Resources, the NPS respectfully requests that the BLM provide additional discussion about possible impacts to water supply wells in Pine Valley resulting from pumping under Alternative D. Given that predicted drawdown at the model boundary between Snake Valley and Pine Valley is on the same order of magnitude as the Proposed Action, there should be similar relevant discussion on the potential impacts to water supply wells in this valley, as was presented for the Proposed Action. Furthermore, in the first paragraph, additional discussion should be provided indicating that two inventoried springs (Stateline and Needle Point Springs) are located in an area that could be impacted at the full build out plus 200 years time frame, so that the discussion is consistent with previous similar discussions about Utah surface water resources.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-197	In the discussion under the minor subheading titled Impacts to Surface Water Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in surface water rights impacts over time and which valleys experience the greatest impact to surface water rights contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been overlooked or downplayed in the current discussion. This information exists in Table F3.3.13-5A (Appendix F3.3.13) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) to be added to this paragraph to address these issues: "The locations and manner of use of the active surface water rights within the drawdown area at full build out and full build out plus 75 years and full build out plus 200 years are presented in Figures F3.3.12A-13, F3.3.12A-14, and F3.3.12A-15, respectively in Appendix F3.3.12. Table F3.3.13-5A (Appendix F3.3.13) lists the number of active surface water rights within the drawdown area that occur within the high-, moderated-, and low-risk areas at the three representative time frames. These results indicate that the number of surface water rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years there are a total of 23 surface water rights located in areas where there is a moderate to high risk of impacts to surface flows. By the full build out plus 200 years time frame, there are 127 surface water right located in areas where there is a moderate to high risk of impacts to surface flows. The greatest impact to surface water rights at the full build-out plus 200 year period occurs in Spring Valley (184) (36 water rights), Lake Valley (34 water rights) and Spring Valley (201) (25 water rights), with lesser impact occurring in Patterson Valley (12 water rights), Snake Valley (10 water rights), Steptoe Valley (5 water rights), Hamlin Valley (3 water rights), and Cave Valley (2 water rights). For surface water rights that are dependent on groundwater discharge, a potential reduction in the water table at the point of diversion, could reduce or eliminate the flow available at the point of diversion for the surface water right." With respect to the proposed third sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for Alternative D. The proposed second to last sentence allows the reader to see that pumping under Alternative D will likely result in proportionately greater impacts to Spring Valley (184), Lake Valley and Spring Valley (201) surface water rights than the other affected valleys. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next. Finally, the results for the number of surface water rights located in areas where impacts could occur at the full build out plus 200 years time frame are reported differently in the text and Table 3.3.2-16 (56 rights) than the numbers reported in Table F3.3.13-5A (127 rights). Please determine which number is correct and make the appropriate corrections to the text and/or tables.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-198	In the discussion under the minor subheading titled Impacts to Groundwater Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in groundwater rights impacts over time, which valleys experience the greatest impact to groundwater rights contained in the affected valleys at the full build-out plus 200 year period, and what impacts are anticipated in the area of Shoshone Ponds. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been neglected or downplayed in the current discussion. This information exists in Table F3.3.15-5A (Appendix F3.3.15) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) be added to this discussion to address these issues: "Figures F3.3.14A-13, F3.3.14A-14, and F3.3.14A-15 in Appendix F3.3.14 illustrate the location and manner of use of existing groundwater rights in relation to the magnitude of the model-simulated drawdown at full build out and at full build out plus 75 years and full build out plus 200 years. Table F3.3.15-5A (Appendix F3.3.15) lists the groundwater rights by hydrographic basin within the drawdown area. These results indicate that the number of groundwater rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years, there are 27 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. At full build out plus 200 years, the number increases to 213 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. The greatest impact to groundwater rights that experience a predicted drawdown of at least 10 feet at the full buildout plus 200 year period occurs in Lake Valley (112 water rights), with lesser impact occurring in Snake Valley (37 water rights), Spring Valley (184) (35 water rights), Hamlin Valley (15 water rights), Cave Valley (7 water rights), Dry Lake Valley (6 water rights), and Delamar Valley (1 water right). It should be noted that the greatest magnitude of drawdown impact will occur in Hamlin Valley, where 10 out the 15 water rights could experience drawdown greater than 50 feet. The potential impacts to individual wells are the same as discussed under the Proposed Action. The predominant beneficial uses for the active groundwater rights within the drawdown area at full build out plus 200 years are irrigation and stockwatering. Additional beneficial uses associated with water rights that could be affected include commercial, mining and milling, municipal, domestic, and wildlife. Impacts to wells could include a reduction in yield, increased pumping cost, or if the water level were lowered below the pump setting or the bottom of the well, the well could be rendered unusable. Actual impacts to the artesian water source at the Shoshone Ponds area in southern Spring Valley would depend on the interconnection between the aquifer that sustains flow in the artesian well and the aquifers developed for production from proposed well field development. Considering the simulated drawdown under Alternative D and the hydrogeologic setting, there is a high risk that well field pumping could eventually result in reducing or drying up artesian flows that sustain Shoshone Ponds." With respect to the proposed third sentence of the first paragraph, this same trend observation was noted in the similar results under the Proposed Action and is also applicable to the results presented for Alternative D. The proposed last two sentences of the first paragraph allows the reader to see that pumping under Alternative D will likely result in proportionately greater impacts to Lake Valley groundwater rights than the other affected valleys, and that the greatest magnitude of impact to groundwater rights will be felt in Hamlin Valley. Lastly, the proposed second and third paragraphs of this discussion are a paraphrasing of the discussion presented for these topics under the Proposed Action. If the results are similar as stated, the NPS suggests refreshing the reader's memory by restating the discussion as it pertains to the results for Alternative D. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-199	In the first paragraph under the minor subheading titled Impacts to Water Balance, the NPS respectfully requests that this paragraph by revised with additional text to address the potential impact to the Great Salt Lake Desert Flow System. Results presented in Table 3.3.2-16 indicate that Alternative D is estimated to have a small impact (16 percent or less) on ET discharge, which should be discussed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-200	In the discussion under the minor subheading titled Monitoring and Mitigation Recommendations, mitigation measure GW-WR-4 (Monitoring, Mitigation and Management Plan for Snake Valley) is listed as being applicable under Alternative D. If there is not going to be any pumping in Snake Valley by the SNWA under this scenario, then why would this mitigation measure be applicable or necessary under Alternative D? The NPS contends that any pumping impacts originating from Spring Valley (184) that could potentially spillover into Snake Valley and effect NPS resources in Great Basin National Park would be addressed under the current Spring Valley stipulated agreement and its associated monitoring, mitigation and management plan, as originally intended.	Thank you for your comment. Please see Standard Resource Response MM-1.

Comments and Responses - Federal Government

ID	Comment	Response
34679-201	In the discussion under the subheading titled Potential Residual Impacts, the NPS respectfully requests that the BLM expand the discussion in the final EIS to refresh the reader's recollection of what potential unavoidable residual impacts to water resources are likely to occur under Alternative D. In the brief discussion about the comparative residual impacts between Alternative D and the Proposed Action, the BLM's statement that "the magnitude of the potential unavoidable residual impacts to water resources associated with the Alternative D pumping scenario would be substantially less than the Proposed Action" seems like a logical conclusion, but it should be substantiated by additional evaluation and discussion of existing data. While it is anticipated that "intensive groundwater withdrawal focused in southern Spring Valley would result in substantially higher magnitude of drawdown in southern Spring Valley and adjacent areas compared to the Proposed Action and all other pumping alternatives," this increased magnitude of drawdown does not appear to translate into comparable degrees of impact to the resources of interest. It is interesting to note that by concentrating pumping in the southern end of Spring Valley (184) and increasing the resulting magnitude of drawdown, Alternative D still has substantially less impact to perennial springs and streams, surface water and groundwater rights, and percent reduction in groundwater discharge to ET in Spring Valley, Snake Valley and the Great Salt Lake Desert Flow System, when compared to the results for the Proposed Action, and Alternatives A and B. In many cases, Alternative D also has lesser impact to these same resources than Alternative C. This positive tradeoff has not been recognized or discussed and is likely due to concentrating the pumping in an area of Spring Valley (184) where there are fewer of these resources present and thus reducing the likelihood of impacting a greater number of these resources in Spring Valley and surrounding valleys. Even if Alternative D is not selected as the Preferred Alternative, the concentration of pumping in southern Spring Valley (184) and other project basins to avoid potential impacts to the resources of interest in these basins potentially has relevance as a mitigation measure, which should be recognized and further evaluated in the final EIS. Furthermore, one can argue that the BLM's statement "Implementation of adaptive mitigation measures proposed by the applicant and included in the stipulated agreements would be difficult to implement to control the magnitude and aerial extent of drawdown resulting from the pumping in southern Spring Valley" (emphasis added) is equally applicable to discussions on SNWA pumping in southern Snake Valley under the Proposed Action and Alternatives A, B and C, given that Snake Valley also has similar aerial constraints on where the mitigation measure of re-distributed pumping can be applied. The NPS requests that the BLM provide similar recognition of this constraint in discussions about the results of pumping in Snake Valley under the Proposed Action and Alternatives A, B and C in the final EIS. The current discussion also fails to evaluate and substantiate the effectiveness of implementing the proposed mitigation measure of cessation or reduction of pumping in southern Spring Valley, which is an option that the SNWA may be required to implement. Please provide additional evaluation and discussion focusing on comparing the current modeling results for Alternative D and the different alternative pumping scenarios in an attempt to better ascertain whether or not it is reasonable to expect the adaptive management measures of geographic re-distribution of pumping and cessation / reduction of pumping will be effective at avoiding adverse impacts to the water resources at Great Basin National Park and other federal and private lands (see previous comments for page 3.3-121 & 3.3-122). Finally, the NPS respectfully requests that the BLM address the likely effects that the water level recovery analysis presented in Appendix F3.3.5 will have on ameliorating these unavoidable residual impacts (see previous comments for page 3.3-122, lines 7-10).	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources; and request to repeat text previously described in the section. Also see standard resource response MM-1 and the response to your comment #152.

Comments and Responses - Federal Government

ID	Comment	Response
34679-202	In the discussion under the minor subheading titled Impacts to Water Levels, the NPS respectfully requests that the BLM expand the discussion to refresh the reader how the results for Alternative E are similar to Alternative A, with respect to the discussion of the effects to water levels in Spring, Cave, Delamar and Dry Lake valleys. Again, statements such as "results are essentially the same as those described for Alternative A" make it difficult for the reader to readily understand the relative impact of Alternative E compared to Alternative A without the reader continually re-acquainting themselves with the similar discussion presented for Alternative A. If the results are similar, the NPS suggests restating the discussion as it pertains to the results for Alternative E. The NPS respectfully requests that the discussion in the second paragraph under this subheading be replaced with the following discussion: "At full build out, the drawdown areas are localized in the vicinity of the pumping wells in Spring, Cave, Delamar, and Dry Lake valleys. Comparison of the simulation results for the three representative points in time indicates that the drawdown area continues to progressively expand as pumping continues into the future. At full build out plus 75 years time frame, there are three distinct drawdown areas. The northernmost drawdown area is a relatively small localized drawdown area located in the northern portion of Spring Valley. The second drawdown area encompasses southern Spring Valley, the southwestern margin of Snake Valley, and the northwestern margin of Hamlin Valley. The third drawdown area extends across Cave, Delamar, and Dry Lake valleys in an elongate north-south direction that is primarily confined to these three pumping basins. By the full build out plus 200 years time frame, the two main drawdown areas are beginning to merge into one that extends approximately 170 miles in a north-south direction and up to 50 miles in a east-west direction that covers an area of approximately ___ square miles. At this time frame, the simulated drawdown area extends into southeastern Steptoe Valley, the eastern margins of Pahroc and Pahranagat Valleys, and the extreme western margins of Panaca Valley and northwest margin of Lower Meadow Valley Wash. The locations of six selected observation wells located within the proposed pumping basins are presented in Figure 3.3.2-6. Water level hydrographs for each of these observation wells within the pumping basins are provided in Figures 3.3.2-7 and 3.3.2-8. The hydrographs illustrate the predicted rate and magnitude of water level decline at these representative locations over the simulation period. As with the Proposed Action, the hydrographs indicate that water levels are predicted to continue to decrease over the model simulation period, and not reach a renewed equilibrium (or steady state condition) before the end of the simulation period. The hydrographs illustrate that because the pumping schedule is the same for Alternative A and Alternative E for Spring, Cave, Delamar, and Dry Lake valleys, the rate and magnitude of drawdown are the same in those valleys. As shown on Figure 3.3.2-7, like Alternative D, Alternative E would substantially reduce the drawdown area in Snake Valley in the vicinity of Baker compared to the Proposed Action, and Alternatives A, B and C." The NPS respectfully requests that the BLM provide additional language to the discussion in the second paragraph above indicating the total area (miles squared) encompassed by the 10-foot drawdown contour for the Alternative E model simulation. This additional information will help the reader to more fully understand the size of the affected area, beyond just describing the general dimensions of the drawdown area. The proposed last paragraph allows the reader to see that pumping under Alternative E will result in much smaller impacts to Snake Valley groundwater levels than the previously discussed pumping alternatives, as this has been overlooked or downplayed in the current discussion. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources. Minor additional text added regarding the drawdown near Baker in Snake Valley in response to comment.

Comments and Responses - Federal Government

ID	Comment	Response
34679-203	In the second paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that additional language (presented in italics) be inserted in this paragraph as follows: "Potential total effects to perennial springs and streams are summarized in Table 3.3.2-18. Comparison of the results of the model simulations and the resource impact evaluation for the three representative time periods indicated that the number of springs and miles of perennial streams that potentially could be affected increases at each successive time period. For the predicted drawdown area at full build out plus 75 years, there are 19 inventoried springs and 36 "other" springs located within the high and moderate risk areas. By full build out plus 200 years this increased to 30 inventoried springs and 74 "other" springs located within the high and moderate risk areas. These springs occur in Cave Steptoe, Hamlin, Spring (HA 184), Snake, and Lake Valleys. The greatest impact to these springs at the full build-out plus 200 year period occurs in Spring Valley (184) (24 inventoried, 65 other), with lesser impact occurring in, Lake Valley (3 inventoried, 4 other), Steptoe Valley (1 inventoried, 5 other), and Hamlin Valley and Cave Valley (1 inventoried spring each). It is noted that Alternative E has the least impact to perennial springs in Snake Valley (no springs affected) when compared to the Proposed Action (77 springs affected) and all of the other alternative pumping scenarios (24 to 108 springs affected). This positive tradeoff is due to the elimination of pumping from Snake Valley and distributing the pumping in Spring Valley (184)." With respect to the proposed second sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for Alternative E. The simple revision to the current last sentence allows the reader to see that pumping under Alternative E will likely result in proportionately greater impacts to Spring Valley (184) than the other affected valleys. An important result that was overlooked by the BLM is that by eliminating pumping from Snake Valley and dispersing pumping throughout Spring Valley (184), Alternative E has the least impact on the number of perennial springs effected in the Snake Valley (none) when compared to the results for the Proposed Action (77 springs), Alternative A (73 springs), Alternative B (108 springs), Alternative C (55 springs), and Alternatives D (24 springs). This overlooked observation is addressed with the inclusion of the last two proposed sentences. This information exists in Table F3.3.9-6A (Appendix F3.3.9) and should be summarized and discussed accordingly. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-204	In the third paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that the BLM present additional discussion on which valleys experience the greatest impact to the perennial streams contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been overlooked or downplayed in the current discussion. This information exists in Table F3.3.11-6A (Appendix F3.3.11) and should be summarized and discussed accordingly. The NPS respectfully requests that the last sentence in this paragraph be revised and additional language be appended as follows to address this issue: "The greatest impact to perennial streams at the full build-out plus 200 year period occurs in Spring Valley (184) (15 miles), with lesser impact occurring in Steptoe Valley (4 miles), Snake Valley (3 miles), and Lake Valley (1 mile). It is noted that Alternative E has the least impact to perennial streams in Snake Valley (3 miles) when compared to the Proposed Action (63 miles) and all of the other alternative pumping scenarios (26 to 73 miles). This positive tradeoff is due to the elimination of pumping from Snake Valley and dispersing the pumping in Spring Valley (184)." These additional revisions allows the reader to see that pumping under the Alternative E will likely result in proportionately greater impacts to Spring Valley (184) perennial streams than the other affected valleys. An important result that was overlooked by the BLM is that by eliminating pumping from Snake Valley and dispersing pumping throughout Spring Valley (184), Alternative E has the least impact on the number of perennial streams effected in the Snake Valley (3 miles) when compared to the results for the Proposed Action (63 miles), Alternative A (61 miles), Alternative B (73 miles), Alternative C (54 miles), and Alternatives D (26 miles). This overlooked observation is addressed with the inclusion of the last two proposed sentences. The NPS believes these changes are needed to provide a more balanced interpretation and consistent description of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-205	In the discussion under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the NPS respectfully requests that the BLM expand the discussion to refresh the reader how the results for Alternative E are similar to Alternative A and the Proposed Action, with respect to the discussion of the effects to the White River Flow System and the Great Salt Lake Desert Flow System. Again, statements such as “results are essentially the same as those described for the Proposed Action or Alternative A” make it difficult for the reader to readily understand the relative impact of Alternative E compared to the Proposed Action or Alternative A without the reader continually re-acquainting themselves with the similar discussion presented for the Proposed Action or Alternative A. If the results are similar, the NPS suggests restating the discussion as it pertains to the results for Alternative E. The NPS respectfully requests that the discussion under this subheading be replaced with the following discussion: “Model-simulated changes in spring flow for selected springs are presented in Table 3.3.2-19. The model results indicate that two of the modeled springs in White River Valley, Butterfield Spring and Flag Springs 3, are predicted to experience an 8 percent flow reduction at the full build out plus 200 years time frame. These results suggest that the groundwater development eventually could affect flows in springs located along the south eastern margin of the valley floor in White River Valley. The model results also indicate that other springs located in the northern portion of the valley floor in White River Valley, are unlikely to experience flow reductions (>5 percent) attributable to the Alternative A pumping. The model results indicate that measurable flow reductions attributable to this alternative are not anticipated in major regional spring discharge areas within the White River Flow System. In the Great Salt Lake Desert Flow System, spring discharge was simulated at 3 springs in Spring Valley and 4 springs in Snake Valley. In Spring Valley, the model simulations indicate that by full build out plus 75 years, the flow at Keegan, North Millick, and South Millick Springs all show slight to moderate reductions of flow (9 to 28 percent). At full build out plus 200 years these springs are predicted to experience flow reductions ranging from 11 to 36 percent. These three springs are all located near the margin of the valley floor in the north central portion of the valley. These results, coupled with the drawdown results, suggest that springs located in the southern portion of the valley that are hydraulically connected to the regional flow system could experience moderate to substantial reductions in flow over the long term, with the likelihood of some springs drying up. In Snake Valley, the model simulation results were used to evaluate potential changes in flow at Big Springs, Foote Reservoir Springs, Kell Spring, and Gandy Warm Springs. The model results indicated that measurable flow reductions (>5 percent) are not anticipated at Foote Reservoir Springs, Kell Springs, and Gandy Warm Springs located in the central portion of the basin. The results suggest that the springs located on the valley floor in the central and northern portion of the basin are unlikely to experience impacts (>5 percent flow reduction). Big Springs located in the southern portion of the basin is predicted to experience a small to moderate reduction in flow (26 percent) by the full build out plus 75 years time frame due to drawdown impacts spilling over into Snake Valley from pumping in Spring Valley. By the full build out plus 200 years time frame, Big Springs is predicted to experience a substantial reduction in flow (78 percent). Reductions of flow at Big Springs would substantially reduce flows in Big Springs Creek and flows to Lake Creek and into Pruess Lake. It should be noted that Alternative E is the only pumping scenario in which Big Springs did not experience a 100 percent reduction in flow during the full build out plus 75 years time frame or the full build out plus 200 years time frame. This model result suggests that while springs located on the valley floor in the southern portion of the valley might experience considerable reductions in flow, with the possibility of some springs drying up, Alternative E pumping should result in a comparatively smaller impact to these springs over the same time frames. This result also suggests that avoidance of pumping in Snake Valley coupled with implementation of re-distributed and/or reduced pumping in Spring Valley under the Spring Valley stipulated agreement, might be the only measures that could prevent Big Springs and other springs in southern Snake Valley from experiencing large reductions in flow or drying up completely. The conclusion that some of these springs may dry up is partially supported by the observation that Needle Point Spring, located northeast of Big Springs in Utah, dried up in response to comparatively smaller agricultural pumping in the area.” The NPS believes these additional text revisions provide a more fair and balanced interpretation and consistent discussion of the likely impacts that could befall many of the springs in southern Spring Valley and Snake Valley, based on the results presented in the draft EIS for Alternative E. In the case of Snake Valley, these additional text revisions are also supported by the fact that Big Springs appears to be located in the high-risk valley floor area (see Figures F3.3.8A-17 and F3.3.8A-18), where the BLM has identified that pumping-related impacts are likely to occur to perennial water resources that depend on flow from the regional groundwater flow system. Additionally, the fact that the BLM’s own Needle Point Springs dried up 10 years ago due to comparatively smaller agricultural pumping in the area (see discussion on pages 3.3-24 and 3.3-25), suggests that the much greater pumping under Alternative E might reduce the flow to or dry up some springs in the southern portion of Snake Valley. This direct line of evidence should be included in the discussion and not ignored.	Additional text was added regarding Big Springs. Also see response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-206	In the discussion under the minor subheading titled Utah Surface Water Resources, the NPS respectfully requests that the last sentence be revised and that additional language (presented in italics) be inserted after this sentence as follows: “Also, model simulations indicate that Alternative E is the only pumping scenario where drawdown is not expected to extend to the boundary of Snake and Pine Valleys. As a result, it is not anticipated that surface water or groundwater resources will be impacted in Pine Valley as a result of pumping under Alternative E.” The NPS believes these changes are needed to provide a more balanced interpretation and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-207	In the discussion under the minor subheading titled Impacts to Surface Water Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in surface water rights impacts over time and which valleys experience the greatest impact to surface water rights contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been overlooked or downplayed in the current discussion. This information exists in Table F3.3.13-6A (Appendix F3.3.13) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) be added to this paragraph to address these issues: “The locations and manner of use of the active surface water rights within the drawdown area at full build out and full build out plus 75 years and full build out plus 200 years are presented in Figures F3.3.12A-16, F3.3.12A-17, and F3.3.12A-18, respectively in Appendix F3.3.12. Table F3.3.13-6A (Appendix F3.3.13) lists the number of active surface water rights within the drawdown area that occur within the high-, moderated-, and low-risk areas at the three representative time frames. These results indicate that the number of surface water rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years there are a total of 60 surface water rights located in areas where there is a moderate to high risk of impacts to surface flows. By the full build out plus 200 years time frame, there are 94 surface water right located in areas where there is a moderate to high risk of impacts to surface flows. The greatest impact to surface water rights at the full build-out plus 200 year period occurs in Spring Valley (184) (77 water rights), with lesser impact occurring in Lake Valley (7 water rights), Steptoe Valley (5 water rights), Snake Valley and Cave Valley (2 water rights each), and Hamlin Valley (1 water right). It is noted that Alternative E has the least impact to surface water rights in Snake Valley (2 rights affected) when compared to the Proposed Action (59 rights affected) and all of the other alternative pumping scenarios (10 to 64 rights affected). This positive tradeoff is due to the elimination of pumping from Snake Valley and distributing the pumping in Spring Valley (184). For surface water rights that are dependent on groundwater discharge, a potential reduction in the water table at the point of diversion, could reduce or eliminate the flow available at the point of diversion for the surface water right.” With respect to the proposed third sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for Alternative E. The proposed second to last sentence allows the reader to see that pumping under Alternative E will likely result in proportionately greater impacts to Spring Valley (184) surface water rights than the other affected valleys. An important result that was overlooked by the BLM is that by eliminating pumping from Snake Valley and dispersing pumping throughout Spring Valley (184), Alternative E has the least impact on the number of surface water rights effected in the Snake Valley (2 rights) when compared to the results for the Proposed Action (59 rights), Alternative A (57 rights), Alternative B (64 rights), Alternative C (48 rights), and Alternatives D (10 rights). This overlooked observation is addressed with the inclusion of the last two proposed sentences. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-208	In the discussion under the minor subheading titled Impacts to Groundwater Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in groundwater rights impacts over time, which valleys experience the greatest impact to groundwater rights contained in the affected valleys at the full build-out plus 200 year period, and what impacts are anticipated in the area of Shoshone Ponds. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been neglected or downplayed in the current discussion. This information exists in Table F3.3.15-6A (Appendix F3.3.15) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) be inserted into this discussion to address these issues: "Figures F3.3.14A-16, F3.3.14A-17, and F3.3.14A-18 in Appendix F3.3.14 illustrate the location and manner of use of existing groundwater rights in relation to the magnitude of the model-simulated drawdown at full build out and at full build out plus 75 years and full build out plus 200 years. Table F3.3.15-6A (Appendix F3.3.15) lists the groundwater rights by hydrographic basin within the drawdown area. These results indicate that the number of groundwater rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years, there are 70 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. At full build out plus 200 years, the number increases to 110 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. The greatest impact to groundwater rights that experience a predicted drawdown of at least 10 feet at the full buildout plus 200 year period occurs in Spring Valley (184) (65 water rights), with lesser impact occurring in Lake Valley (23 water rights), Hamlin Valley (8 water rights), Cave Valley (7 water rights), Dry Lake Valley (6 water rights), and Delamar Valley (1 water right). The greatest magnitude of drawdown impact will occur in Spring Valley (184), where 49 out the 65 water rights could experience drawdown greater than 50 feet, and that no groundwater rights in Snake Valley will be affected by pumping under Alternative E. It is noted that Alternative E has the least impact to groundwater rights in Snake Valley (no rights affected) when compared to the Proposed Action (129 rights affected) and all of the other alternative pumping scenarios (37 to 111 rights affected). This positive tradeoff is due to the elimination of pumping from Snake Valley and distributing the pumping in Spring Valley (184). The potential impacts to individual wells are the same as discussed under the Proposed Action. The predominant beneficial uses for the active groundwater rights within the drawdown area at full build out plus 200 years are irrigation and stockwatering. Additional beneficial uses associated with water rights that could be affected include commercial, mining and milling, municipal, domestic, and wildlife. Impacts to wells could include a reduction in yield, increased pumping cost, or if the water level were lowered below the pump setting or the bottom of the well, the well could be rendered unusable. Actual impacts to the artesian water source at the Shoshone Ponds area in southern Spring Valley would depend on the interconnection between the aquifer that sustains flow in the artesian well and the aquifers developed for production from proposed well field development. Considering the simulated drawdown under Alternative E and the hydrogeologic setting, there is a high risk that well field pumping could eventually result in reducing or drying up artesian flows that sustain Shoshone Ponds." With respect to the proposed third sentence of the first paragraph, this same trend observation was noted in the similar results under the Proposed Action and is also applicable to the results presented for Alternative E. The additional proposed sentences to the first paragraph allows the reader to see that pumping under Alternative E will likely result in proportionately greater impacts to Spring Valley (184) groundwater rights than the other affected valleys, that the greatest magnitude of impact to groundwater rights also will be felt in Spring Valley (184), and that there will be no impacts to groundwater rights in Snake Valley. Lastly, the proposed second and third paragraphs of this discussion are a paraphrasing of the discussion presented for these topics under the Proposed Action. If the results are similar as stated, the NPS suggests refreshing the reader's memory by restating the discussion as it pertains to the results for Alternative E. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-209	In the first paragraph under the minor subheading titled Impacts to Water Balance, the NPS respectfully requests that this paragraph by revised with additional text to address the potential impact to the Great Salt Lake Desert Flow System. Results presented in Table 3.3.2-16 indicate that Alternative E is estimated to have a small impact (24 percent or less) on ET discharge, which should be discussed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next. Additionally, the NPS would suggest inserting the word "minimal" before the word "reductions" in the last sentence of this discussion to better qualify the expected impacts to Pine, Wah Wah, and Tule Valleys and Fish Springs.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-210	In the discussion under the minor subheading titled Monitoring and Mitigation Recommendations, mitigation measure GW-WR-4 (Monitoring, Mitigation and Management Plan for Snake Valley) is listed as being applicable under Alternative E. If there is not going to be any pumping in Snake Valley by the SNWA under this scenario, then why would this mitigation measure be applicable or necessary under Alternative E? The NPS contends that any pumping impacts originating from Spring Valley (184) that could potentially spillover into Snake Valley and effect NPS resources in Great Basin National Park would be addressed under the current Spring Valley stipulated agreement and its associated monitoring, mitigation and management plan, as originally intended.	Thank you for your comment. Please see Standard Resource Response MM-1.

Comments and Responses - Federal Government

ID	Comment	Response
34679-211	In the discussion under the subheading titled Potential Residual Impacts, the NPS respectfully requests that the BLM expand the discussion in the final EIS to refresh the reader's recollection of what potential unavoidable residual impacts to water resources are likely to occur under Alternative E. Furthermore, please provide additional evaluation and discussion focusing on comparing the current modeling results for Alternative E and the different alternative pumping scenarios in an attempt to better ascertain whether or not it is reasonable to expect the adaptive management measures of geographic re-distribution of pumping and cessation / reduction of pumping will be effective at avoiding adverse impacts to the water resources at Great Basin National Park and other federal and private lands (see previous comments for page 3.3-121 & 3.3-122). Additionally, the NPS respectfully requests that the BLM address the likely effects that the water level recovery analysis presented in Appendix F3.3.5 will have on ameliorating these unavoidable residual impacts (see previous comments for page 3.3-122, lines 7-10).	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources; and request to repeat text previously described in the section. Also see responses to your comments #152 and #148.
34679-212	In the discussion under the subheading titled Groundwater Pumping Scenario, the NPS respectfully requests that the BLM expand the discussion in the final EIS to identify the annual amount of existing pumping that was simulated under the No Action alternative. Previous discussions for the Proposed Action and Alternatives A through E all identified the amount of annual pumping that was simulated. Additionally, it would instructive to the reader if a table was presented in the final EIS that identified the hydrographic basins where existing pumping was occurring, as well as the annual amount of existing pumping occurring in each of these basins. This additional information is important to give the reader further context on the extent and degree of existing pumping that is occurring relative to the additional amount of pumping proposed under the Proposed Action and Alternatives A through E, as this has been overlooked or downplayed in the current discussion. This additional information is also important for the reader to understand the amount of cumulative pumping that will occur under the different cumulative effects analyses.	Groundwater withdrawal rates estimated for the region for No Action are presented in the transient model report (SNWA 2009b) that was incorporated by reference into the EIS which was provided on a CD included with distribution of the DEIS. Also See response WR-8 regarding the request to provide additional data in the EIS.
34679-213	In the third and fourth paragraphs under the minor subheading titled Impacts to Water Levels, the NPS respectfully requests that the BLM provide additional language to the discussion indicating the total area (miles squared) encompassed by the 10-foot drawdown contour for the main drawdown areas under the No Action alternative model simulation. This additional information will help the reader to more fully understand the size of the affected area, beyond describing the general dimensions of the drawdown area.	The simulated drawdown areas are provided in a series of maps provided through the water resources impact discussion. The methodology used to evaluate potential impacts to springs and streams is described in Section 3.3.2.8 of the EIS. As explained in Section 3.3.2.8, the impact analyses does not rely on or use the number of square miles within the drawdown area in the water resources impact analysis. Therefore, providing this information is not relevant to the water resource analysis primarily because the drawdown area includes mountainous upland areas which were determined to be areas where impacts to surface water resources are unlikely to occur.
34679-214	In the discussion under the minor subheading titled Impacts to Water Levels, the NPS respectfully requests that the BLM provide additional evaluation and discussion about the No Action alternative water level responses at the six observation wells that were presented in Figures 3.3.2-7 and 3.3.2-8. How do the water level responses to pumping under the No Action scenario compare to the water level responses under the Proposed Action and the other pumping scenarios? This additional evaluation and discussion is important to give the reader further context on the extent and degree of existing pumping effects on water levels in the project basins, relative to the water level effects associated with pumping under the Proposed Action and Alternatives A through E, as this has been neglected or downplayed in the current discussion. The NPS believes this additional discussion is needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	A brief description of the trends exhibited on the water level hydrographs was added in response to the comment.

Comments and Responses - Federal Government

ID	Comment	Response
34679-215	In the second paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that additional language (presented in italics) be inserted in this paragraph as follows: "Potential total effects to perennial springs and streams are summarized in Table 3.3.2-20. Comparison of the results of the model simulations and the resource impact evaluation for the three representative time periods indicated that the number of springs and miles of perennial streams that potentially could be affected increases at each successive time period. For the predicted drawdown area at full build out plus 75 years, there are 12 inventoried springs and 34 "other" springs located within the high and moderate risk areas. By full build out plus 200 years this increased to 20 inventoried springs and 66 "other" springs located within the high and moderate risk areas. These springs occur in White River, Spring (HA 184), Lake, Spring (HA 201), Panaca, Clover Valleys, Lower Meadow Valley Wash, and Las Vegas Valley. The greatest impact to these springs at the full build-out plus 200 year period occurs in Lake Valley (6 inventoried, 20 other), Spring Valley (201) (1 inventoried, 17 other), and Patterson Valley (1 inventoried, 11 other), with lesser impact occurring in, Clover Valley (2 inventoried, 7 other), Lower Meadow Valley Wash (3 inventoried, 4 other), White River Valley (4 inventoried), Panaca Valley (1 inventoried, 2 other), Spring Valley (184) (3 other), Las Vegas Valley (2 inventoried), and Eagle Valley and Dry Valley (1 other each). It should be noted that impacts to springs in Spring Valley (184), Snake Valley, Cave Valley, Delamar Valley and Dry Lake Valley from existing pumping in these valleys is negligible to non-existent." With respect to the proposed second sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for the No Action alternative. The proposed last two sentences allows the reader to see that pumping under the No Action alternative will likely result in proportionately greater impacts to Lake Valley, Spring Valley (201) and Patterson Valley than the other affected valleys, and that effects to springs in the project basins from existing pumping is negligible to non-existent, as this has been overlooked or downplayed in the current discussion. This information exists in Table F3.3.9-7A (Appendix F3.3.9) and should be summarized and discussed accordingly. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-216	In the third paragraph under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that the BLM present additional discussion on which valleys experience the greatest impact to the perennial streams contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from pumping under the No Action alternative, as this has been overlooked or downplayed in the current discussion. This information exists in Table F3.3.11-7A (Appendix F3.3.11) and should be summarized and discussed accordingly. The NPS respectfully requests that the last sentence in this paragraph be revised and additional language be added as follows to address this issue: "The greatest impact to perennial streams at the full build-out plus 200 year period occurs in Spring Valley (201) (17 miles) and Clover Valley (15 miles), with lesser impact occurring in White River Valley (9 miles), Lower Meadow Valley Wash (5 miles), Panaca Valley (3 miles), Lake Valley (2 miles), and Spring Valley (184) (<1 mile). It should be noted that impacts to perennial streams in Spring Valley (184), Snake Valley, Cave Valley, Delamar Valley and Dry Lake Valley from existing pumping in these valleys is negligible to non-existent." These additional revisions allows the reader to see that pumping under the No Action alternative will likely result in proportionately greater impacts to Spring Valley (201) and Clover Valley perennial streams than the other affected valleys, and that effects to springs in the project basins from existing pumping is negligible to non-existent. The NPS believes these changes are needed to provide a balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-217	In the second paragraph under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the discussion of the model simulation results for the Muddy River refers to predicted flow reductions near Overton which are not represented in Table 3.3.2-21. Please correct this oversight in the table and provide additional discussion clarifying whether the 60% reduction in river flow near Overton is the result of existing groundwater pumping or existing diversion of surface water from the river, as this is unclear from the current discussion. Furthermore, please provide clarification in the discussion about the Muddy River Memorandum of Agreement as to whether or not the predicted flow reductions at the three Muddy River observation sites (Moapa, Glendale, and Overton) would cause an exceedance of the referenced minimum in-stream flow levels and whether or not mitigation measures under this agreement address the potential flow reductions predicted to occur at these three observation sites.	Groundwater modeling in the area around Overton is complicated due to water being diverted into the Bowman Reservoir. Consequently, groundwater modeling results for the area south of the Muddy River at Glendale gage are unreliable and are not presented on Table 3.3.2-21. The following information, supported by material presented in the numerical model report (SNWA, 2009b) is intended to further explain the complexities of the system in this geographical area. As depicted in Figure 6-34 of the numerical model report (SNWA, 2009b), the model is well calibrated in the areas of the Moapa and Glendale gages, with simulated flows matching observations, but is poorly calibrated in the region of the Overton and Lake Mead gages. As described in Section 4.4 of the numerical model report (SNWA, 2009b), a combination of real and pseudo stream gages were inserted into the model from the Muddy River Springs area to Lake Mead. As described in Appendix B (SNWA, 2009b), the focus of model calibrations on the Muddy River were near the Moapa and Glendale gages. Analysis of the stream flow data for the Moapa and Glendale gages consisted of (1) removing flood flows from the daily mean stream flow measurements, (2) deriving monthly discharge volumes from the daily mean stream flow measurements, and (3) calculating calendar year stream flow measurements. A detailed explanation of this activity is presented in Appendix B (SNWA, 2009b). South of the Muddy River at Glendale gage, the Muddy River is diverted into the Bowman Reservoir. The Reservoir is privately owned and operated by the Muddy Valley Irrigation Company for the purposes of water storage and controlled distribution. The Muddy River at Overton gage and the Muddy River at Lake Mead gage locations occur downstream of the Reservoir and its complex distribution system. Additionally, the flow rates observed before the construction of Bowman Reservoir are unknown. They were, therefore, assigned estimated observation rates and very large standard deviations (uncertainty), which reduces their weights in the calibration. The standard deviation assigned to the flow rate at the Lake Mead gage was equal to half the target value. This is equivalent to an error of 100- percent at the 95-percent confidence level. Furthermore, the standard deviation for the Overton gage was set to 1020 m3/d which translates into a weight of essentially zero. This means that the model was loosely calibrated to the estimated flow at the Lake Mead gage, but the estimated flow at the Overton gage was effectively not used as a calibration target. The Overton and Lake Mead observation locations occur significantly downstream from the Moapa and Glendale gages. Given that the criteria for impacts to changes in flow were not exceeded for Project Simulations at the Moapa or Glendale gages, it is safe to assume that there would be no Project related impacts in the areas of the Overton and Lake Mead observations.
34679-218	In the third paragraph under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the NPS respectfully requests that the following additional sentence be inserted at the end of this paragraph in the final EIS: “These results indicate that continuation of existing pumping in Spring Valley and Snake Valley likely will have little or no effect on spring and stream discharge in these valleys.” This additional language is important to give the reader further context on the extent and degree of existing pumping effects on spring and stream discharge in the project basins, relative to the spring and stream discharge effects associated with pumping under the Proposed Action and Alternatives A through E, as this has been overlooked or downplayed in the current discussion. The NPS believes this additional language is needed to provide a more balanced and consistent discussion of repeatable trends and important results from one pumping scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-219	The NPS respectfully requests that the BLM provide a discussion on Water Resources Within or Adjacent to the Great Basin National Park under the evaluation of the pumping-related impacts associated with the No Action alternative. This discussion has been provided for all other pumping scenarios analyzed under this EIS but has been neglected for the No Action pumping scenario. The NPS respectfully offers the following language for consideration and inclusion in the final EIS: "Water Resources Within or Adjacent to the GBNP. Surface water resources located within or adjacent to Great Basin National Park that occur within both the model-simulated drawdown area and within the susceptibility zones identified by Elliot et al. are listed in Table 3.3.2-8. For the purpose of the EIS analysis, these areas are considered zones of moderate risk as defined in Table 3.3.2-3 (i.e., impacts may occur to some perennial waters that are hydraulically connected to the regional flow system). The simulation results indicate there are no water resources identified in the moderate risk zone at the full build out plus 75 years time frame or the full build out plus 200 years time frame. These results indicate that a continuation of existing pumping under the No Action alternative presents the least amount of risk to water resources (associated with the simulated drawdown) within or adjacent to Great Basin National Park when compared to similar results related to the Proposed Action and all other pumping alternatives evaluated under this EIS." This additional language is important to give the reader context on the extent and degree of existing pumping effects on surface water resources located within or adjacent to Great Basin National Park, relative to the effects associated with pumping under the Proposed Action and Alternatives A through E. The NPS believes this discussion is needed to provide a more balanced and consistent discussion of repeatable trends and important results from one pumping scenario to the next.	A description of potential effects to surface water resources in the GBNP was added. See response WR-8 regarding the request for additional information requested in the comment.
34679-220	The NPS respectfully requests that the BLM provide a discussion on Utah Surface Water Resources under the evaluation of the pumping-related impacts associated with the No Action alternative. This discussion has been provided for all other pumping scenarios analyzed under this EIS but has been neglected for the No Action pumping scenario. The NPS respectfully offers the following language for consideration and inclusion in the final EIS: "Utah Surface Water Resources. The predicted small reduction in flow at Big Springs under the No Action alternative would result in small reductions in flow to Big Springs Creek, Lake Creek and into Pruess Lake. However, the No Action alternative model simulations suggest that potential flow reductions at Big Springs (and downstream in Lake Creek) would be considerably less than under all other pumping alternatives. The model simulations also indicate that, like Alternative E, drawdown is not expected to extend to the boundary of Snake and Pine Valleys. As a result, it is not anticipated that surface water or groundwater resources will be impacted in Pine Valley as a result of a continuation of existing pumping under the No Action Alternative." This additional language is important to give the reader context on the extent and degree of existing pumping effects on Utah surface water resources, relative to the effects associated with pumping under the Proposed Action and Alternatives A through E. The NPS believes this discussion is needed to provide a more balanced and consistent discussion of repeatable trends and important results from one pumping scenario to the next.	A description of potential effects to surface water resources in the Utah was added.

Comments and Responses - Federal Government

ID	Comment	Response
34679-221	In the discussion under the minor subheading titled Impacts to Surface Water Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in surface water rights impacts over time and which valleys experience the greatest impact to surface water rights contained in the affected valleys at the full build-out plus 200 year period. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from a continuation of existing pumping, as this has been overlooked or downplayed in the current discussion. This information exists in Table F3.3.13-7A (Appendix F3.3.13) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) be included in this paragraph to address these issues: "The locations and manner of use of the active surface water rights within the simulated drawdown area for No Action at the full build out and full build out plus 75 years and full build out plus 200 years time frames are presented in Figures F3.3.12A-19, F3.3.12A-20, and F3.3.12A-21, respectively in Appendix F3.3.12. Table F3.3.13-7A (Appendix F3.3.13) lists the number of active surface water rights within the drawdown area that occur within the high-, moderated-, and low-risk areas at the three representative time frames. These results indicate that the number of surface water rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years there are a total of 105 surface water rights located in areas where there is a moderate to high risk of impacts to surface flows. By the full build out plus 200 years time frame, there are 164 surface water right located in areas where there is a moderate to high risk of impacts to surface flows. The greatest impact to these springs at the full build-out plus 200 year period occurs in Lake Valley (33 rights), Spring Valley (201) (32 rights), Patterson Valley (22 rights), Clover Valley (18 rights), White River Valley (16 rights), and Panaca Valley and Lower Meadow Valley Wash (15 rights each), with lesser impact occurring in Spring Valley (184) (9 rights), and Eagle Valley and Dry Valley (2 rights each). It should be noted that impacts to surface water rights in Spring Valley (184), Snake Valley, Cave Valley, Delamar Valley and Dry Lake Valley from existing pumping in these valleys will be negligible to non-existent. For surface water rights that are dependent on groundwater discharge, a potential reduction in the water table at the point of diversion, could reduce or eliminate the flow available at the point of diversion for the surface water right. With respect to the proposed third sentence, this same trend observation was noted in the similar discussion of results under the Proposed Action and is also applicable to the results presented for the No Action alternative. The proposed second and third to last sentences allows the reader to see that existing pumping under the No Action alternative will likely result in proportionately greater impacts to surface water rights in the valleys south and east of the project basins, and that effects to surface water rights in the project basins from existing pumping is negligible to non-existent. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-222	In the discussion under the minor subheading titled Impacts to Groundwater Rights, the NPS respectfully requests that the BLM present additional discussion on the trend in groundwater rights impacts over time, which valleys experience the greatest impact to groundwater rights contained in the affected valleys at the full build-out plus 200 year period, and what impacts are anticipated in the area of Shoshone Ponds. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from a continuation of existing pumping, as this has been neglected or downplayed in the current discussion. This information exists in Table F3.3.15-7A (Appendix F3.3.15) and should be summarized and discussed accordingly. The NPS respectfully requests that the following additional language (presented in italics) be included in this discussion to address these issues: "Figures F3.3.14A-19, F3.3.14A-20, and F3.3.14A-21 in Appendix F3.3.14 illustrate the location and manner of use of existing groundwater rights in relation to the magnitude of the model-simulated drawdown at full build out and at full build out plus 75 years and full build out plus 200 years. Table F3.3.15-7A (Appendix F3.3.15) lists the groundwater rights by hydrographic basin within the drawdown area. These results indicate that the number of groundwater rights that potentially could be affected increases over the model simulation period. At full build out plus 75 years, there are 372 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. At full build out plus 200 years, the number increases to 409 groundwater rights located within areas that are predicted to experience a reduction in groundwater levels of at least 10 feet. The greatest impact to groundwater rights that experience a predicted drawdown of at least 10 feet at the full buildout plus 200 year period occurs in Lake Valley (97 rights), Panaca Valley (84 rights), and White River Valley (75 rights), with lesser impact occurring in Patterson Valley (37 rights), Garnet Valley (26 rights), Clover Valley (24 rights), Lower Meadow Valley Wash (23 rights), Spring Valley (184) (16 rights), Black Mountains Area (12 rights), Dry Valley (5 rights), Las Vegas Valley (4 rights), Steptoe Valley (3 rights), and Cave Valley, Dry Lake Valley and Hidden Valley (North) (1 right each). It should be noted that the greatest magnitude of drawdown impact will occur in Lake Valley, where 81 out the 97 water rights could experience drawdown greater than 50 feet, and that impacts to groundwater rights in Spring Valley (184), Snake Valley, Cave Valley, Delamar Valley and Dry Lake Valley from existing pumping in these valleys will be minimal to non-existent. The potential impacts to individual wells are the same as discussed under the Proposed Action. The predominant beneficial uses for the active groundwater rights within the drawdown area at full build out plus 200 years are irrigation and stockwatering. Additional beneficial uses associated with water rights that could be affected include commercial, mining and milling, municipal, domestic, and wildlife. Impacts to wells could include a reduction in yield, increased pumping cost, or if the water level were lowered below the pump setting or the bottom of the well, the well could be rendered unusable. Actual impacts to the artesian water source at the Shoshone Ponds area in southern Spring Valley would depend on the interconnection between the aquifer that sustains flow in the artesian well and the aquifers developed for production from proposed well field development. Considering the simulated drawdown under the No Action alternative and the hydrogeologic setting, there is negligible risk that a continuation of existing pumping could eventually result in reducing or drying up artesian flows that sustain Shoshone Ponds."	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-223	With respect to the proposed third sentence of the first paragraph, this same trend observation was noted in the similar results under the Proposed Action and is also applicable to the results presented for the No Action alternative. The proposed last two sentences of the first paragraph allows the reader to see that pumping under the No Action alternative will likely result in proportionately greater impacts to groundwater rights predominantly in the valleys south and east of the project basins, that the greatest magnitude of impact to groundwater rights will be felt in Lake Valley, and that effects to groundwater rights in the project basins from existing pumping is minimal to non-existent. Lastly, the proposed second and third paragraphs of this discussion are a paraphrasing of the discussion presented for these topics under the Proposed Action. If the results are similar as stated, the NPS suggests refreshing the reader's memory by restating the discussion as it pertains to the results for the No Action alternative. The NPS believes these changes are needed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-224	In the first paragraph under the minor subheading titled Impacts to Water Balance, the NPS respectfully requests that this paragraph by revised with additional text to address the potential impact to the Great Salt Lake Desert Flow System. Results presented in Table 3.3.2-16 indicate that the No Action alternative is estimated to have a negligible impact (5 percent or less) on ET discharge, which should be discussed to provide a more balanced and consistent discussion of repeatable trends and important results from one alternative scenario to the next. Additionally, please remove the words "For Spring Valley" which are repeated after the words "for Spring Valley" in the second sentence of this discussion.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources. The typographical error was corrected.
34679-225	Please insert a subheading titled Impacts to Water Levels after the section heading for Section 3.3.2.16 to be consistent with the discussion format presented in previous sections 3.3.2.8 through 3.3.2-15.	A subheading was added for consistency.

Comments and Responses - Federal Government

ID	Comment	Response
34679-226	In the third paragraph under subsection 3.3.2.16 titled Summary and Comparison of Alternative Pumping Scenarios, the NPS respectfully requests that this paragraph by revised with additional text to better summarize the comparison of the drawdown effects between the Proposed Action and Alternative A, and how these results relate to the potential effectiveness of implementing the mitigation measures of geographic redistribution of pumping and cessation / reduction in pumping throughout the project basins, especially in Snake Valley near Great Basin National Park. The NPS is concerned that these aspects have been neglected or downplayed in the discussion and should be addressed more fully in the final EIS. The NPS respectfully requests that the following additional language (presented in italics) be included in this discussion to address these issues: "The groundwater pumping scenario for Alternative A assumes pumping at reduced quantities (approximately 115,000 afy) from those listed on the pending water rights application for the five proposed project pumping basins (Spring, Snake, Cave, Delamar, and Dry Lake valleys). The well distribution developed by the SNWA for this model scenario distributes the simulated production wells spatially within the groundwater development areas in an effort to minimize pumping effects. Compared to the Proposed Action, the reduced pumping under Alternative A would reduce the drawdown area (Figure 3.3.2-34) particularly in northern Spring Valley, northern Lake Valley and along the southern margin of the drawdown area. The National Park Service notes that a comparison of the two drawdown areas in Snake Valley indicates that a 35 percent total reduction in pumping (29 percent reduction in Snake Valley) in the project basins under Alternative A has a minimal positive tradeoff on reducing the extent of the drawdown in Snake Valley, especially in the vicinity of Great Basin National Park. The NPS also notes that the extent of the drawdown areas in Snake Valley under the Proposed Action and Alternative A are very similar, strongly suggesting that cessation or reduction in pumping by itself might be ineffective as a mitigation measure in Snake Valley. The NPS attributes this conclusion partially to the slow and incomplete recovery of water levels indicated by the BLM's water level recovery analysis that are likely to occur when pumping would be reduced or stopped. The NPS also attributes this conclusion partially to the limited amount of area in Snake Valley in which the SNWA can locate their pumping wells, which will also make it very difficult to effectively implement an early warning monitoring network in the valley. " As stated in earlier comments (e.g., see comments for page 3.3-121 & 3.3-122), additional evaluation and discussion focusing on comparing the current modeling results for the Proposed Action and the different alternative pumping scenarios is needed in the final EIS to better ascertain whether or not it is reasonable to expect the adaptive management measures of geographic re-distribution of pumping and cessation / reduction of pumping will be effective in all cases at avoiding adverse impacts to the water resources at Great Basin National Park and other federal and private lands. Furthermore, the current discussion in this paragraph completely ignores any comparison of the results in Snake Valley, an area that the BLM stated earlier in the draft EIS is of great interest. The NPS believes this additional language is necessary to provide a more in depth and balanced discussion of the differences and similarities in the potential impacts between the Proposed Action and the alternative pumping scenarios, and the potential effectiveness of proposed mitigation measures.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-227	In the fourth paragraph under subsection 3.3.2.16 titled Summary and Comparison of Alternative Pumping Scenarios, the NPS respectfully requests that this paragraph by revised with additional text to better summarize the comparison of the drawdown effects between the Proposed Action and Alternative B, and how these results relate to the potential effectiveness of implementing the mitigation measures of geographic redistribution of pumping and cessation / reduction in pumping throughout the project basins, especially in Snake Valley near Great Basin National Park. The NPS is concerned that these aspects have been neglected or downplayed in the discussion and should be addressed more fully in the final EIS. The NPS respectfully requests that the following additional language (presented in italics) be included this discussion to address these issues: "The Alternative B pumping scenario assumes pumping at the full diversion rates (i.e., approximately 177,000 afy) listed on the pending water rights application for the five proposed project pumping basins (Spring, Snake, Cave, Delamar, and Dry Lake valleys) and that wells would be developed at the actual points of diversion listed on the water rights applications. Compared to the Proposed Action which geographically re-distributes the same amount of pumping within the project basins, the Alternative B pumping scenario would expand the area of drawdown along the southeast margin of Steptoe Valley, and in the Southern Snake Range between Spring and Snake Valley, and in southern Lake Valley (Figure 3.3.2-35). The drawdown area for Alternative B also does not extend into northern Spring Valley (HA 184) or Tippett Valley. The National Park Service notes that a comparison of the two drawdown areas in Snake Valley indicates that concentrating the pumping at a small number of pumping centers under Alternative B has a negative tradeoff in that the drawdown area greatly expands into Great Basin National Park. The NPS also notes that while the extent of the drawdown areas in Snake Valley under the Proposed Action is lessened somewhat, drawdown still encroaches into the park, suggesting that geographic re-distribution of pumping by itself may be ineffective as a mitigation measure in Snake Valley. The NPS attributes this conclusion largely to the limited amount of area in Snake Valley in which the SNWA can locate their pumping wells, which will also make it very difficult to effectively implement an early warning monitoring network in the valley." As stated in the comment above, additional evaluation and discussion focusing on comparing the current modeling results for the Proposed Action and the different alternative pumping scenarios is needed in the final EIS to better ascertain whether or not it is reasonable to expect the adaptive management measures of geographic re-distribution of pumping and cessation / reduction of pumping will be effective in all cases at avoiding adverse impacts to the water resources at Great Basin National Park and other federal and private lands. Furthermore, the current discussion in this paragraph completely ignores any comparison of the results in Snake Valley, an area that the BLM stated earlier in the draft EIS is of great interest. As a result, the current discussion completely ignores the fact that pumping under Alternative B will have the greatest impact to resources in Great Basin National Park. The NPS believes this additional language is necessary to provide a more in-depth and balanced discussion of the differences and similarities in the potential impacts between the Proposed Action and the alternative pumping scenarios, and the potential effectiveness of proposed mitigation measures.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-228	In the fifth paragraph under subsection 3.3.2.16 titled Summary and Comparison of Alternative Pumping Scenarios, the NPS respectfully requests that this paragraph by revised with additional text to better summarize the comparison of the drawdown effects between the Proposed Action and Alternative C, and how these results relate to the potential effectiveness of implementing the mitigation measures of geographic redistribution of pumping and cessation / reduction in pumping throughout the project basins, especially in Snake Valley near Great Basin National Park. The NPS is concerned that these aspects have been downplayed in the discussion and should be addressed more fully in the final EIS. The NPS respectfully requests that the following additional language (presented in italics) be included this discussion to address these issues: "The Alternative C pumping scenario assumes the same distribution of groundwater production wells defined for Alternative A and that instead of pumping at a sustained rate of 115,000 afy (as in Alternative A) after full build out, the pumping rates would cycle from minimum (9,000 afy) to maximum (115,000 afy) pumping rates every 5 years after full build out. This pumping scenario produces an average total pumping rate of 62,000 afy over the simulation period in the project basins. The maximum pumping rate under this scenario is the same as for Alternative A (approximately 115,000 afy). The model simulations indicate that the reduction in groundwater withdrawal under Alternative C would further reduce the extent of the drawdown area in several portions of the modeled area as shown on Figure 3.3.2-36. The National Park Service notes that a comparison of the two drawdown areas in Snake Valley indicates that the 65 percent total reduction in average pumping (62 percent reduction in Snake Valley) in the project basins under Alternative C has some positive effect on reducing the extent of the drawdown in Snake Valley by the full build out plus 75 years time frame, but has no appreciable effect on reducing the extent of drawdown in the vicinity of Great Basin National Park by the full build out plus 200 years time frame. The NPS also notes that since the extent of the drawdown areas in Snake Valley under the Proposed Action and Alternative C are very similar by the full build out plus 200 years time frame, this strongly suggests that further cessation or reduction of pumping in Snake Valley (average pumping rate of 19,000 afy after full build out), coupled with the spatial distribution of pumping under Alternative C, may be ineffective as mitigation measures in Snake Valley. The NPS attributes this conclusion partially to the slow and incomplete recovery of water levels indicated by the BLM's water level recovery analysis that are likely to occur when pumping would be cycled from its maximum to minimum rate. The NPS also attributes this conclusion partially to the limited amount of area in Snake Valley in which the SNWA can locate their pumping wells, which will also make it very difficult to effectively implement an early warning monitoring network in the valley." As stated in the two previous comments, additional evaluation and discussion focusing on comparing the current modeling results for the Proposed Action and the different alternative pumping scenarios is needed in the final EIS to better ascertain whether or not it is reasonable to expect the adaptive management measures of geographic re-distribution of pumping and cessation / reduction of pumping will be effective in all cases at avoiding adverse impacts to the water resources at Great Basin National Park and other federal and private lands. Furthermore, the current discussion in this paragraph completely ignores any comparison of the results in Snake Valley, an area that the BLM stated earlier in the draft EIS is of great interest. The NPS believes this additional language is necessary to provide a more in-depth and balanced discussion of the differences and similarities in the potential impacts between the Proposed Action and the alternative pumping scenarios, and the potential effectiveness of proposed mitigation measures.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-229	In the sixth paragraph under subsection 3.3.2.16 titled Summary and Comparison of Alternative Pumping Scenarios, the NPS respectfully requests that this paragraph by revised with additional text to better summarize the comparison of the drawdown effects between the Proposed Action and Alternative D, and how these results relate to the potential effectiveness of implementing the mitigation measures of geographic re-distribution of pumping and cessation / reduction in pumping throughout the project basins, especially in Snake Valley near Great Basin National Park. The NPS is concerned that these aspects have been overlooked or downplayed in the discussion and should be addressed more fully in the final EIS. The NPS respectfully requests that the following additional language (presented in italics) be included in this discussion to address these issues: "The groundwater pumping scenario for Alternative D assumes that no pumping will occur in Snake Valley, and pumping in Spring Valley would be restricted to the southern portion of the valley within Lincoln County. The maximum groundwater production rate under this scenario is approximately 79,000 afy for the four pumping basins (Spring, Cave, Delamar, and Dry Lake valleys) is the same as the maximum pumping rate assumed for these basins under Alternative A, C, and E. The well distribution developed by the SNWA for this model scenario includes the same spatial distribution of wells included in Alternative A for Cave, Delamar, and Dry Lake valleys. Compared to the Proposed Action, Alternative D provides a positive tradeoff by limiting drawdown in the central and northern portion of Spring Valley and southern portion of Snake Valley; while subsequently providing a negative tradeoff by expanding drawdown in Lake Valley, Hamlin Valley and into northern Spring Valley (HA 201) (Figure 3.3.2-37). The National Park Service notes that a comparison of the two drawdown areas in Snake Valley indicates that avoidance of pumping in Snake Valley under Alternative D has the positive tradeoff of greatly reducing the extent of the drawdown in Snake Valley and in the vicinity of Great Basin National Park. This alternative would substantially reduce the extent of the drawdown area in Snake Valley compared with the Proposed Action and Alternatives A, B and C. The NPS also notes that the dissimilarity in the extent of the drawdown areas in Snake Valley under the Proposed Action and Alternative D strongly suggests that avoidance of pumping near sensitive resources such as Great Basin National Park may be very effective in limiting pumping impacts to sensitive resources in the project basins when compared to the use of other adaptive management measures such as geographic re-distribution of pumping and cessation / reduction of pumping." As stated in the three previous comments, additional evaluation and discussion focusing on comparing the current modeling results for the Proposed Action and the different alternative pumping scenarios is needed in the final EIS to better ascertain whether or not it is reasonable to expect the adaptive management measures of geographic re-distribution of pumping and cessation / reduction of pumping, or other measures such as avoidance of pumping, will be effective in all cases at avoiding adverse impacts to the water resources at Great Basin National Park and other federal and private lands. Furthermore, the current discussion in this paragraph barely makes a comparison of the results in Snake Valley, an area that the BLM stated earlier in the draft EIS is of great interest. The NPS believes this additional language is necessary to provide a more in-depth and balanced discussion of the differences and similarities in the potential impacts between the Proposed Action and the alternative pumping scenarios, and the potential effectiveness of proposed mitigation measures.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-230	In the seventh paragraph under subsection 3.3.2.16 titled Summary and Comparison of Alternative Pumping Scenarios, the NPS respectfully requests that this paragraph by revised with additional text to better summarize the comparison of the drawdown effects between the Proposed Action and Alternative E, and how these results relate to the potential effectiveness of implementing the mitigation measures of geographic redistribution of pumping and cessation / reduction in pumping throughout the project basins, especially in Snake Valley near Great Basin National Park. The NPS is concerned that these aspects have been overlooked or downplayed in the discussion and should be addressed more fully in the final EIS. The NPS respectfully requests that the following additional language (presented in italics) be included in this discussion to address these issues: "The Alternative E pumping scenario includes the same spatial distribution of wells included in Alternative A for Spring, Cave, Delamar, and Dry Lake valleys but assumes no pumping in Snake Valley. The maximum groundwater production rate under this scenario is approximately 79,000 afy for the four pumping basins (Spring, Cave, Delamar, and Dry Lake valleys) is the same as the maximum pumping rate assumed for these same basins under Alternative A, C, and D. Because the pumping schedule for Alternative E is identical to Alternative A for Spring, Cave, Delamar, and Dry Lake valleys, the predicted drawdown for Spring, Cave, Delamar, and Dry Lake valleys (and adjacent areas) are essentially the same as for Alternative A (compare with Figure 3.3.2-34). The National Park Service notes that a comparison of the two drawdown areas in Snake Valley indicates that avoidance of pumping in Snake Valley under Alternative E has the positive tradeoff of greatly reducing the extent of the drawdown in Snake Valley and in the vicinity of Great Basin National Park. This alternative would substantially reduce the extent of the drawdown area in Snake Valley compared with the Proposed Action and Alternatives A, B and C. The NPS also notes that the dissimilarity in the extent of the drawdown areas in Snake Valley under the Proposed Action and Alternative E strongly suggests that avoidance of pumping near sensitive resources such as Great Basin National Park may be very effective in limiting pumping impacts to sensitive resources in the project basins when compared to the use of other adaptive management measures such as geographic re-distribution of pumping and cessation / reduction of pumping." As stated in the four previous comments, additional evaluation and discussion focusing on comparing the current modeling results for the Proposed Action and the different alternative pumping scenarios is needed in the final EIS to better ascertain whether or not it is reasonable to expect the adaptive management measures of geographic re-distribution of pumping and cessation / reduction of pumping, or other measures such as avoidance of pumping, will be effective in all cases at avoiding adverse impacts to the water resources at Great Basin National Park and other federal and private lands. Furthermore, the current discussion in this paragraph needs improvement on the comparison of the results in Snake Valley, an area that the BLM stated earlier in the draft EIS is of great interest. The NPS believes this additional language is necessary to provide a more in-depth and balanced discussion of the differences and similarities in the potential impacts between the Proposed Action and the alternative pumping scenarios, and the potential effectiveness of proposed mitigation measures.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.
34679-231	The discussion in the ninth paragraph under subsection 3.3.2.16 titled Summary and Comparison of Alternative Pumping Scenarios, fails to compare the results of the No Action alternative with the Proposed Action like previous paragraphs in this section have. The discussion that is presented is essentially the same one presented on page 3.3-171. The NPS respectfully requests the BLM to revise the discussion in this paragraph to reflect a fair and balanced comparison of the extent of the drawdown areas for the No Action alternative and the Proposed Action. The NPS would like to offer two observations to be considered for inclusion in this discussion in the final EIS. First, comparison of the results in Figure 3.3.2-39 clearly indicates that a continuation of existing pumping in the project basins has little or no effect on drawdown in these basins compared to the Proposed Action and Alternatives A through E. This clearly demonstrates that the SNWA's proposed project will have considerable impact on the water levels in the project basins under each pumping scenario evaluated when compared to the status quo. Furthermore, Figure 3.3.2-39 clearly shows that existing pumping under the No Action alternative in Spring Valley and Snake Valley has no measurable drawdown impacts on water resources in Great Basin National Park, as defined in the draft EIS. Second, the extent of drawdown resulting from pumping under the No Action alternative is largely constrained to hydrographic basins located south and east of the project basins. Additionally, the overlapping of drawdown areas for the No Action alternative and the Proposed Action is largely constrained to Lake Valley, Spring Valley, and Dry Lake Valley.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-232	In the discussion under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that the BLM present additional discussion on which valleys generally experience the greatest impact to the perennial springs and streams contained in the affected valleys. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been overlooked or downplayed in the current discussion. Additional discussion should also be presented summarizing the potential effectiveness of the proposed mitigation measures in reducing the degree of impacts to perennial springs and streams in the project basins. The NPS respectfully requests that the following language (presented in italics) be included in this discussion in the final EIS to address these issues: "As described previously, springs that are controlled by discharge from (or hydraulically interconnected with) the regional groundwater flow system and located within areas that experience a reduction in groundwater levels would likely experience a reduction in flow. The number of inventoried springs and miles of perennial stream located within the model-simulated drawdown area and located within areas determined to have a high or moderate risk of impacts are summarized in Table 3.3.2-22 and graphically illustrated in Figures 3.3.3-40 and 3.3.3-41. These charts indicate that the number of springs and miles of stream at risk of impacts increases over time for all of the alternative pumping scenarios. The model-simulated drawdown for the two alternatives with the largest groundwater withdrawal rate (Proposed Action and Alternative B) potentially impact flows in the largest number of springs and miles of perennial stream reach. Comparison of the results for the Proposed Action and Alternative B indicates that the application of dispersed pumping by itself under the Proposed Action might be somewhat effective at reducing the degree of impacts to perennial springs and streams in some of the project basins. However, compared with the results for the Proposed Action and Alternative B, the combined deployment of distributed and reduced pumping assumed modeled for Alternative A appears to be more effective in reducing the number of springs and miles of perennial stream potentially at risk from drawdown effects in some of the project basins. Compared to the Proposed Action, the reduced drawdown areas resulting from the Alternative A pumping scenario would reduce the number of springs and miles of streams potentially impacted. Further reduction in pumping and/or elimination of pumping under Alternatives C, D, and E pumping scenarios would further reduce the extent and/or magnitude of the drawdown area compared to Alternative A, and would potentially impact the smallest number of inventoried springs and miles of perennial stream reach in the region. Alternatives C, D and E appear to have the smallest incremental impacts on perennial springs in the project area, while Alternative E appears to have the smallest incremental impact on perennial streams in the project area. Results also indicated that for the Proposed Action, and Alternatives A, B and C, the greatest impacts to perennial springs and streams would generally occur in Spring Valley (HA 184) and Snake Valley. Results indicated that for Alternative D, the greatest impacts to perennial springs and streams would generally occur in Spring Valley (HA 184), Lake Valley, Snake Valley, and Spring Valley (HA 201). Results indicated that for Alternative E, the greatest impacts to perennial springs and streams would generally occur in Spring Valley (HA 184). It is interesting to note that by concentrating pumping in the southern end of Spring Valley (184) and increasing the resulting magnitude of drawdown in that area, Alternative D still has the least impact to perennial springs and streams in Spring Valley (HA 184) when compared to the Proposed Action and all of the other alternative pumping scenarios. This positive tradeoff is likely due to concentrating the pumping in an area of Spring Valley (184) where there are fewer perennial springs and streams, thus avoiding the likelihood of impacting a greater number of springs and streams in the valley. Additionally, it is noted that Alternative E has the least impact to perennial springs and streams in Snake Valley when compared to the Proposed Action and all of the other alternative pumping scenarios. This positive tradeoff is due to the elimination of pumping from Snake Valley and dispersing the pumping in Spring Valley (HA 184)." The NPS believes these changes are necessary to provide a more in-depth and balanced interpretation and consistent summary of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources. Also see Section 3.20 and response MM-1 regarding BLM's proposed monitoring, management and mitigation plan for the GWD project.

Comments and Responses - Federal Government

ID	Comment	Response
34679-233	Additionally, the NPS respectfully requests that the BLM provide summary discussions on Model-simulated Spring and Stream Discharge Estimates, Water Resources Within or Adjacent to the GBNP, and Utah Surface Water Resources in the final EIS, consistent with discussions of the repeatable trends and important results that were presented under each individual pumping scenario presented in sections 3.3.2.9 through 3.3.2.15, and the additional discussion requested by the NPS in its comments to the draft EIS. A summary of the important observations and trends related to these three topic areas has been completely ignored in section 3.3.2.16. With respect to the missing summary discussion on Water Resources Within or Adjacent to the GBNP, the NPS requests discussion recognizing that Alternative B, and to a lesser extent the Proposed Action and Alternative A, pose the greatest threats to perennial spring and stream resources in Great Basin National Park, while Alternative E poses the least threat to these same water resources, based on the results presented in Table 2.2.3-8. The discussion should incorporate an evaluation of the likely effectiveness of the proposed mitigation measures of geographic re-distribution of pumping and cessation / reduction of pumping, along with an evaluation of the likely effectiveness of pumping avoidance in Snake Valley, on reducing potential impacts to the park's water resources. This evaluation should also consider how the results of the water level recovery analysis presented in Appendix F3.3.5 might impact the effectiveness of these mitigation measures. It is the NPS's contention that the current results strongly indicate that the use of geographic re-distribution of pumping and cessation / reduction of pumping in Snake Valley will be ineffective at preventing impacts to park water resources, due largely to the limited amount of area in Snake Valley in which the SNWA can locate their pumping wells, which will also makes it very difficult to effectively implement an early warning monitoring network in the valley. It is also the NPS's contention that the results for Alternatives D and E suggest that avoidance of pumping in Snake Valley and near sensitive resources may be very effective in limiting pumping impacts to sensitive resources in the project basins when compared to the use of the other mitigation measures. Finally, the summary discussion should also evaluate the potential effect to water resources in caves located within or adjacent to the park.	Additional text was added to compare the relative risk to park resources associated with the alternatives. Also see response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

Comments and Responses - Federal Government

ID	Comment	Response
34679-234	In the discussion under the minor subheading titled Impacts to Water Rights, the NPS respectfully requests that the BLM present additional discussion on which valleys generally experience the greatest impact to the surface water and groundwater rights contained in the affected valleys. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest impact from the GWD project pumping, as this has been overlooked or downplayed in the current discussion. Additional discussion should also be presented summarizing the potential effectiveness of the proposed mitigation measures in reducing the degree of impacts to surface water and groundwater rights in the project basins. The NPS respectfully requests that the following language (presented in italics) be added to this discussion in the final EIS to address these issues: "The number of surface water rights located in areas where impacts to surface water resources could occur and number of groundwater rights located within the areas where the model simulations indicate drawdown of 10 feet or more are listed in Table 3.3.2-22. There are a large number of existing surface water and groundwater rights located in areas where impacts from drawdown could occur under both the No Action and groundwater development pumping scenarios. The main difference between the effects posed by the No Action pumping and the groundwater development pumping scenarios is that existing pumping in the project basins has substantially less effect on existing water rights in these basins than the proposed GWD project pumping. The model results indicate that drawdown for the two alternatives with the largest groundwater withdrawal rate (Proposed Action and Alternative B) could potentially impact the largest number of water rights. The reduced drawdown areas resulting from the other alternatives (Alternatives A through E) would decrease the number of water rights impacted. Comparison of the results for the Proposed Action and Alternative B indicates that the application of dispersed pumping by itself under the Proposed Action would likely be ineffective over the long-term at reducing the degree of impacts to surface water and groundwater rights in some of the project basins, as the number of impacted water rights increases with time under the Proposed Action. However, compared with the results for the Proposed Action and Alternative B, the combined deployment of distributed and reduced pumping modeled for Alternative A would appear to be effective in reducing the number of surface water and groundwater rights potentially at risk from drawdown effects. Further reduction in pumping and/or elimination of pumping under Alternatives C, D, and E pumping scenarios would further reduce the extent and/or magnitude of the drawdown area compared to Alternative A, and would potentially impact smaller numbers of surface water and groundwater rights in the region. Alternative D pumping appears to have the smallest incremental impact on surface water rights in the project area, while Alternative E pumping appears to have the smallest incremental impact on groundwater rights in the project area. Results also indicated that for the Proposed Action, and Alternatives A, B and C, the greatest impacts to surface water rights and groundwater rights would generally occur in Spring Valley (HA 184) and Snake Valley. Results indicated that for Alternative D, the greatest impacts to surface water rights and would generally occur in Spring Valley (HA 184), Lake Valley, and Spring Valley (HA 201), while the greatest impact to groundwater rights would occur in Lake Valley. Results indicatde that for Alternative E, the greatest impacts to surface water rights and groundwater rights would occur in Spring Valley (HA 184). Finally, considering the simulated drawdown under all of the groundwater development pumping scenarios and the hydrogeologic setting, there is a moderate to high risk that well field pumping under all of the scenarios could eventually result in reducing or drying up artesian flows that sustain Shoshone Ponds." The NPS believes these changes are necessary to provide a more in-depth and balanced interpretation and consistent summary of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources. Also see Section 3.20 and response MM-1 regarding BLM's proposed monitoring, management and mitigation plan for the GWD project.

Comments and Responses - Federal Government

ID	Comment	Response
34679-235	In the discussion under the minor subheading titled Impacts to Water Balance, the NPS respectfully requests that the BLM present additional discussion summarizing the potential effectiveness of the proposed mitigation measures in reducing the degree of groundwater discharge to evapotranspiration in the project basins, and groundwater flow to Pine, Wah Wah and Tule Valleys, and Fish Springs. This additional discussion is important to give the reader additional context on the potential effectiveness of the proposed mitigation measures, as this has been overlooked or downplayed in the current discussion. The NPS respectfully requests that the following language (presented in italics) be included in the second paragraph of this discussion in the final EIS to address these issues: "The Proposed Action would result in the largest reductions in groundwater discharge to the ET areas within Spring and Snake valleys; with estimated reductions of up to 84 percent in Spring Valley, and up to 34 percent in Snake Valley. For Snake Valley, most of the reductions of groundwater discharge to ET areas would occur in the south portion of the valley. Comparison of the results for the Proposed Action and Alternative B indicates that the application of dispersed pumping under the Proposed Action has the negative tradeoffs of increasing the percent reduction in groundwater discharge to ET in these two valleys and the Great Salt Lake Desert Flow System, as well as further reducing groundwater flow to Pine, Wah Wah and Tule Valleys, and Fish Springs. This suggests that re-distribution of pumping by itself would likely be an ineffective mitigation measure to lessen the pumping impacts to natural groundwater discharge to ET in these areas and nearby Utah water resources posed by pumping under Alternative B. However, compared with the results for the Proposed Action and Alternative B, the combined deployment of distributed and reduced pumping modeled for Alternative A would appear to be effective in lessening the pumping impacts to natural groundwater discharge to ET in Spring Valley and the Great Salt Lake Desert Flow System, but not in Snake Valley; as well as lessening the impacts on groundwater flow to Pine, Wah Wah and Tule Valleys, and Fish Springs. Further reduction in pumping and/or elimination of pumping under Alternatives C, D, and E pumping scenarios would further lessen the pumping impacts to natural groundwater discharge to ET in most of these areas and on groundwater flow to Pine, Wah Wah and Tule Valleys, and Fish Springs, compared to Alternative A. The model results indicate that Alternative D would have the least impact to the ET areas in Spring Valley because the pumping is concentrated in the south end of the valley away from much of the ET areas. This result is similar to the reduction in impacts to perennial springs and streams in Spring Valley observed under Alternative D. The concentrated pumping under Alternative D results in the deepest drawdown cone indicating that a higher percentage of the groundwater withdrawn under this scenario is from groundwater storage compared to the other groundwater development alternatives. The model results indicate that Alternative E would result in the smallest impacts to the ET area in Snake Valley and on groundwater flow to Pine, Wah Wah and Tule Valleys, and Fish Springs." The NPS believes these changes are necessary to provide a more in-depth and balanced interpretation and consistent summary of repeatable trends and important results from one alternative scenario to the next.	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources. Also see Section 3.20 and response MM-1 regarding BLM's proposed monitoring, management and mitigation plan for the GWD project.
34679-236	In the last paragraph under the minor subheadings titled Impacts to Water Levels, No Action Cumulative Pumping Scenario, the NPS respectfully requests that the following additional sentence be inserted at the end of this paragraph in the final EIS: "However, pumping included in the No Action cumulative scenario does contribute to water level drawdown in Cave, Dry Lake and Delamar Valleys."The NPS believes this additional language is necessary to provide a more in-depth and balanced interpretation of the important results.	The predicted drawdown under the No Action pumping scenario is graphically presented in Figures 3.3.3-2, 3.3.3-3 and 3.3.3.4 in the EIS. These figures illustrate minimal effects to drawdown in Cave, Dry Lake and Delamar Valleys except locally at or near the east margin of these basins. See response WR-8 regarding request for additional details.
34679-237	In the discussion under the minor subheadings titled Impacts to Water Levels, Groundwater Development Pumping Scenarios (Proposed Action and Alternatives A through E), the NPS respectfully requests that the BLM present additional discussion under the results discussion presented for Spring and Snake Valleys expanding on the cumulative effects in the vicinity of the Shoshone Ponds area and the interbasin flow zone between Spring and Snake Valleys. The NPS respectfully requests that the following language (presented in italics) be included in this discussion in the final EIS to address this issue: "(1) Spring and Snake Valleys: The predicted cumulative drawdown is essentially the same as the project only drawdowns described previously. In other words, the continuation of existing pumping and reasonably foreseeable pumping (included in the No Action cumulative pumping scenario) is not expected to substantially increase drawdown effects over those predicted in Section 3.3.2 for the project specific effects. Exceptions include an increase in drawdown observed in the Shoshone Ponds area that occurs under the Proposed Action, and Alternatives A, B, C and E, and an increase in drawdown in the interbasin flow zone between Spring Valley and Snake Valley that occurs under Alternative C." The NPS believes this additional language is necessary to provide a more in-depth and balanced interpretation of the important results.	The additional sentence regarding drawdown in the Shoshone ponds area was added as requested. The EIS water resources analysis focuses on potential effects to water resources (such as springs, streams and water rights) and not on simulated changes in flow across basin boundaries. Therefore, the suggested language regarding changes interbasin flow was not provided in the text but is available for review by interested persons in the model simulation results that are incorporated by reference.

Comments and Responses - Federal Government

ID	Comment	Response
34679-238	As part of the discussions on cumulative impacts to water resources in the final EIS, the NPS respectfully requests that the BLM develop a set of additional tables that clearly summarize the incremental effects from past and present actions, the proposed action and reasonably foreseeable future actions for each of the proposed pumping scenarios (i.e., Proposed Action and Alternatives A through E). The draft EIS currently quantifies the incremental effects of the No Action alternative and the Proposed Action (and Alternatives A through E), but does not address the incremental effect associated with reasonably foreseeable future actions. Tables such as these are important for giving the reader additional context on which of these three components has the greatest incremental contribution to the overall total cumulative impact. These tables should address the same water resource issues of concern and simulation time frames as Table 3.3.3-1 does. The NPS suggests the following format for the tables: Effect from Past & Effect from Effect from Total Water Resource Issue Present Actions Proposed Action Future Actions Cumulative (No Action) Effect 75 years after full build-out Drawdown effects on springs Drawdown effects on streams Drawdown effects on surface water rights Drawdown effects on groundwater rights Percent reduction in ET 200 years after full build-out Drawdown effects on springs Drawdown effects on streams Drawdown effects on surface water rights Drawdown effects on groundwater rights Percent reduction in ET The sum of the three individual incremental effects should equal (or nearly so) the total cumulative effect for each water resource issue of concern. Tabular presentation and discussion of these results is consistent with CEQ guidance on determining the environmental consequences of cumulative effects, which recommends that determination of magnitude begin with determining the separate effects of past and present actions, the proposed action (and reasonable alternatives), and other future actions. Tabulation and presentation of this information should help the reader and BLM decision-makers to more clearly see the relative contribution of existing pumping, proposed pumping and reasonably foreseeable pumping to the overall cumulative pumping impact.	See response to comment your comment #123.

Comments and Responses - Federal Government

ID	Comment	Response
34679-239	In the discussion under the minor subheading titled Impacts to Springs and Streams, the NPS respectfully requests that the BLM present additional discussion on which valleys generally experience the greatest cumulative impact to the perennial springs and streams contained in the affected valleys. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest cumulative impacts from the combined existing pumping, GWD project pumping and reasonably foreseeable pumping, as this has been overlooked or downplayed in the current discussion. The discussion should also address the relative contribution of the GWD project pumping to the total cumulative impacts to perennial springs and streams in the project pumping basins and other basins in the modeled area. The NPS respectfully requests that the following language (presented in italics) be included in this discussion in the final EIS to address these issues: "As described previously, springs that are controlled by discharge from (or hydraulically interconnected with) the regional groundwater flow system and located within areas that experience a reduction in groundwater levels would likely experience a reduction in flow. The number of inventoried springs and miles of perennial stream located within the model-simulated cumulative drawdown area and located within areas determined to have a high or moderate risk of impacts are presented in Table 3.3.3-1 and illustrated in Figure 3.3.3-6 and Figure 3.3.3-7. These charts illustrate that the number of springs and miles of stream at risk of impacts increases over time for all of the cumulative pumping scenarios. For the No Action cumulative pumping scenario, there are 19 and 28 inventoried springs, and 42 miles and 79 miles of perennial streams at the full build out plus 75 years and full build out plus 200 years time frame, respectively, located in areas where impacts to perennial water could occur. Because the No Action cumulative pumping scenario is a component of the other alternative pumping scenarios, the total number of springs and miles of perennial stream identified for the No Action cumulative scenario is included in the other 6 groundwater development pumping alternatives (i.e., Proposed Action and Alternatives A through E). Comparison of the total cumulative pumping results for the Proposed Action and Alternatives A through E in Table 3.3.3-1 with the incremental pumping results for the Proposed Action and Alternatives A through E in Table 3.3.2-22 indicates that approximately 41 percent (Alternative C) to 76 percent (Alternative B) of the total cumulative effect of pumping on inventoried perennial springs in the groundwater model area is attributable to the proposed GWD project pumping. Similarly, comparison of the total cumulative pumping results for the Proposed Action and Alternatives A through E in Table 3.3.3-1 with the incremental pumping results for the Proposed Action and Alternatives A through E in Table 3.3.2-22 indicates that approximately 19 percent (Alternative E) to 60 percent (Alternative B) of the total cumulative effect of pumping on perennial streams in the groundwater model area is attributable to the proposed GWD project pumping. Similar to the incremental effects analysis, the model-simulated cumulative drawdown for the two alternatives with the largest groundwater withdrawal rate (Proposed Action and Alternative B) potentially could impact flows in the largest number of springs and miles of perennial stream reaches in the modeled area. Comparison of the total cumulative pumping results for the Proposed Action and Alternative B indicates that the application of dispersed pumping by itself under the Proposed Action might be somewhat effective at reducing the degree of cumulative impacts to perennial springs and streams in some of the project basins. The reduced drawdown areas resulting from the combined application of distributed and reduced GWD project pumping under the Alternative A cumulative pumping scenario potentially would help to reduce the number of springs and miles of streams impacted, when compared to the results for the Proposed Action and Alternative B. Likewise, further reduction in pumping and/or elimination of pumping under Alternatives C, D, and E cumulative pumping scenarios would further reduce the extent and/or magnitude of the drawdown area compared to Alternative A, and potentially would impact the smallest number of inventoried springs and miles of perennial stream reaches in the modeled area. Alternative D appears to have the smallest cumulative impact on perennial springs in the modeled area, while Alternative E appears to have the smallest cumulative impact on perennial streams in the modeled area. Cumulative impact results presented in Tables F3.3.9-1B through F3.3.9-7B (Appendix F3.3.9) indicated that for the Proposed Action, and Alternatives A, B and C at the full build out plus 200 years time frame, the greatest cumulative impacts to perennial springs would generally occur in Spring Valley (HA 184) (20-34 inventoried springs, 42-189, other springs) and Snake Valley (12-42 inventoried springs, 48-68 other springs). The results indicated that for Alternative D at the full build out plus 200 years time frame, the greatest cumulative impacts to perennial springs would generally occur in Spring Valley (HA 184) (13 inventoried springs, 30 other springs), Spring Valley (HA 201) (1 inventoried spring, 27 other springs), Lake Valley (7 inventoried springs, 20 other springs), and Snake Valley (7 inventoried springs, 20 other springs). Results indicated that for Alternative E at the full build out plus 200 years time frame, the greatest cumulative impacts to perennial springs would generally occur in Spring Valley (HA 184) (27 inventoried springs, 76 other springs). For the No Action alternative at the full build out plus 200 years time frame, the results indicated that the greatest cumulative impact to perennial springs would generally occur in Lake Valley (6 inventoried springs, 20 other springs), Spring Valley (HA 201) (1 inventoried springs, 17 other springs), Steptoe Valley (3 inventoried springs, 14 other springs), and Clover Valley (3 inventoried springs, 11 other springs). Cumulative impacts to springs in the five project pumping basins under the No Action alternative at the full build out plus 200 years time frame were negligible, with Spring Valley (HA 184) (4 other springs) being the only basin where measureable effects from combined existing and reasonably foreseeable future pumping were observed. This result confirms that cumulative impacts to perennial springs in the five project pumping basins are almost exclusively due to the GWD project pumping in these basins. Cumulative impact	See response WR-8 regarding the request to add more detailed descriptions of the potential impacts to water resources.

ID	Comment	Response
	results presented in Tables F3.3.11-1B through F3.3.11-7B (Appendix F3.3.11) indicated that for the Proposed Action, and Alternatives A, B and C at the full build out plus 200 years time frame, the greatest cumulative impacts to perennial streams would generally occur in Snake Valley (57-73 miles) and Spring Valley (HA 184) (13-40 miles). The results indicated that for Alternative D at the full build out plus 200 years time frame, the greatest cumulative impacts to perennial streams would generally occur in Snake Valley (26 miles), and Spring Valley (HA 201) (22 miles). Results indicated that for Alternative E at the full build out plus 200 years time frame, the greatest cumulative impacts to perennial streams would generally occur in Spring Valley (HA 184) (18 miles), Spring Valley (HA 201) (18 miles), Snake Valley (17 miles), and Clover Valley (17 miles). For the No Action alternative at the full build out plus 200 years time frame, the results indicated that the greatest cumulative impact to perennial streams would generally occur in Lower Meadow Valley Wash (22 miles), Spring Valley (HA 201) (17 miles), and Clover Valley (17 miles). Cumulative impacts to streams in the five project pumping basins under the No Action alternative were negligible, with Spring Valley (HA 184) (1 mile) being the only basin where measureable effects from combined existing and reasonably foreseeable future pumping were observed. This result confirms that cumulative impacts to perennial streams in the five project pumping basins are almost exclusively due to the GWD project pumping in these basins."The NPS believes these changes are necessary to provide a more in-depth and balanced interpretation and consistent summary of repeatable trends and important results from one alternative scenario to the next.	
34679-240	In the discussion under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the NPS respectfully requests that the BLM combine and revise the discussion in the fourth and fifth paragraphs to better clarify for the reader how the Muddy River Memorandum of Agreement could mitigate the cumulative effects predicted for the Muddy River Springs area. The NPS respectfully suggests that the discussion be revised (suggested revisions in italics) as follows: "Muddy River Springs near Moapa is the headwaters for Muddy River and represents the largest groundwater discharge at the lower end of the White River flow system. The predicted reductions in flow at Muddy River Springs are presented in Figure 3.3.3-9. The model results predict that groundwater withdrawal included in the No Action cumulative pumping scenario would eventually result in up to 61 percent reduction in flow at the Muddy River Springs. Most of the reduction in flow can be attributed to the pumping associated with reasonably foreseeable future actions in the region, including the pumping of SNWA's existing water rights in nearby Coyote Spring Valley. These model-simulated flow changes are similar for all of the groundwater development cumulative pumping scenarios, indicating negligible additional reductions in flow are contributed from the GWD Project for all alternatives. (Note that the numerical model simulations do not account for the existing Muddy River Memorandum of Agreement regarding groundwater withdrawal in Coyote Spring Valley and California Wash basins, among the SNWA, Moapa Valley Water District, Coyote Spring Investment, Moapa Band of Paiutes, and USFWS. This agreement requires that minimum in-stream flow levels will be maintained through the implementation of mitigation measures such as redistribution of pumping and/or cessation or reduction in pumping, if necessary. The groundwater model could not address these minimum in-stream flow requirements, thus they are not reflected in the simulation results. Based on the agreement, potential flow reductions at the Muddy River Springs under the No Action cumulative pumping scenario are anticipated to be less than those simulated by the model.) Most of the reduction in flow can be attributed to the pumping included under reasonably foreseeable future actions in the region. These model-simulated flow changes are essentially the same for all of the groundwater development cumulative pumping scenarios, indicating negligible additional reductions in flow from the GWD Project for all alternatives."	The text was revised for clarification.
34679-241	In the seventh paragraph under the minor subheading titled Model-simulated Spring and Stream Discharge Estimates, the NPS respectfully requests that the following additional sentence be inserted at the end of this paragraph in the final EIS: "This result confirms that cumulative impacts to perennial spring and stream discharge in Spring Valley are almost exclusively due to the GWD project pumping, and not existing pumping or reasonably foreseeable future pumping in the immediate area." This additional language is important to give the reader further context on the extent and degree of existing cumulative pumping impacts on spring and stream discharge in the project basins associated with existing and reasonably foreseeable future pumping, relative to similar impacts associated with the GWD pumping project, as this has been overlooked or downplayed in the current discussion. The NPS believes this additional language is needed to provide a more balanced and consistent discussion of repeatable trends and important results from one pumping scenario to the next.	Text was added in response to the comment.

Comments and Responses - Federal Government

ID	Comment	Response
34679-242	In the discussion under the first paragraph on page 3.3-203, the NPS respectfully requests that the BLM revise the discussion in this paragraph to better clarify for the reader that existing and reasonably foreseeable future pumping will have negligible effects on further reducing the flow at Big Springs in Snake Valley, and that the impacts observed under each of the cumulative impacts analyses is due almost exclusively to the GWD project pumping in Snake Valley and/or Spring Valley. The NPS respectfully suggests that the discussion be revised (suggested revisions in italics) as follows: “For Big Springs in Snake Valley, the cumulative impact model simulations results indicate that flow reductions for the No Action cumulative scenario (Table F3.3.6-7B in Appendix F3.3.6) are the same as previously described in Table 3.3.2-21 under the No Action pumping scenario (Section 3.3.2-15). Similar to the results presented in Sections 3.3.2.9 through 3.3.2.14, the cumulative impact model simulation results for all of the groundwater development alternatives (Tables F3.3.6-1B to F3.3.6-6B) indicate that are expected to result in substantial reductions in flow at Big Springs (Figure 3.3.3-10) will occur. Reductions of flow at Big Springs would substantially reduce flows in Big Springs Creek and flows to Lake Creek and into Pruess Lake. It is noted that Alternative E is the only cumulative pumping scenario in which Big Springs did not experience a 100 percent reduction in flow, suggesting that avoidance of pumping in Snake Valley, coupled with the implementation of the mitigation measures contained in the Spring Valley stipulated agreement may be the only measures that could help prevent Big Springs and other springs in southern Snake Valley from experiencing large reductions in flow or drying up completely. These results strongly indicate that existing pumping and reasonably foreseeable future pumping in the area will have negligible effects on reducing the flow at Big Springs, and that the substantial flow reductions at Big Springs and other springs in southern Snake Valley will be due almost exclusively to pumping related to the groundwater development alternatives. Similar to the results presented in Sections 3.3.2.9 through 3.3.2.14, the cumulative impact model simulations indicate that none of the cumulative pumping scenarios would reduce flows in the three other springs simulated in the groundwater model, indicating again that existing pumping, and reasonably foreseeable future pumping in Snake Valley would have negligible impacts to these three springs. These springs are located in the central portion of Snake Valley (Foote Reservoir Spring, Kell Spring, and Warm Creek near Gandy).” This additional language is important to give the reader further context on the extent and degree of cumulative pumping effects on spring and stream discharge in the project basins associated with existing pumping and reasonably foreseeable future pumping, relative to similar cumulative effects associated with the GWD pumping project, as this has been overlooked or downplayed in the current discussion. The NPS believes this additional language is needed to provide a more in-depth and balanced interpretation and consistent summary of repeatable trends and important results from one pumping scenario to the next.	This point was addressed in the FEIS although the suggested language was not incorporated verbatim.
34679-243	The NPS respectfully requests that the BLM conduct an evaluation and provide summary discussions on the cumulative impacts to Water Resources Within or Adjacent to the GBNP and Utah Surface Water Resources as part of the larger discussion on Modelsimulated Spring and Stream Discharge Estimates in the final EIS. A summary of the important observations and trends related to these two topic areas has been neglected in the current cumulative impacts discussion. These discussions should be consistent with the discussions of the repeatable trends and important results that were presented under each individual pumping scenario presented in Sections 3.3.2.9 through 3.3.2.15, and the associated additional discussion previously requested by the NPS in its comments to the draft EIS. With respect to the missing summary discussion on cumulative impacts to Water Resources Within or Adjacent to the GBNP, the NPS would like to see discussion recognizing which cumulative pumping scenario(s) poses the greatest threat to perennial spring and stream resources in Great Basin National Park. The BLM should provide a table of cumulative impact results similar to Table 2.2.3-8 in the final EIS so that the reader can better understand the total cumulative impacts to park water resources resulting from the six pumping scenarios that were evaluated. The discussion should also incorporate an evaluation of the likely effectiveness of the proposed mitigation measures of geographic re-distribution of pumping and cessation / reduction of pumping, along with an evaluation of the likely effectiveness of pumping avoidance in Snake Valley, on reducing potential cumulative impacts to the park’s water resources. This evaluation should also consider how the results of the water level recovery analysis presented in Appendix F3.3.5 might impact the effectiveness of these mitigation measures. It is the NPS’s contention that the cumulative impact results will also indicate that the use of geographic re-distribution of pumping and cessation / reduction of pumping in Snake Valley will be ineffective at preventing cumulative impacts to park water resources, due largely to the limited amount of area in Snake Valley in which the SNWA can locate their pumping wells, which will also makes it very difficult to effectively implement an early warning monitoring network in the valley. It is also the NPS’s contention that the cumulative impact results for Alternatives D and E will suggest that avoidance of pumping in Snake Valley and near sensitive resources may be more effective in limiting cumulative pumping impacts to sensitive resources in the project basins, especially when coupled with the use of the other mitigation measures identified in the Spring Valley stipulated agreement. Finally, the summary discussion should also evaluate the potential cumulative effect to water resources in caves located within or adjacent to the park.	Please see Standard Resource Response WR-1, specifically the language related to model refinement, and MM-1 related to monitoring, managmement and mitigation.

Comments and Responses - Federal Government

ID	Comment	Response
34679-244	In the discussion under the minor subheading titled Impacts to Water Rights, the NPS respectfully requests that the BLM present additional discussion on which valleys generally experience the greatest cumulative impact to surface water and groundwater rights contained in the affected valleys. This additional discussion is important to give the reader additional context on which valleys will suffer the greatest cumulative impacts from the combined existing pumping, GWD project pumping and reasonably foreseeable pumping, as this has been overlooked or downplayed in the current discussion. The discussion should also address the relative contribution of the GWD project pumping to the total cumulative impacts to surface water and groundwater rights in the project pumping basins and other basins in the modeled area. Additional discussion should also be presented summarizing the potential effectiveness of the proposed mitigation measures in reducing the degree of cumulative impacts to surface water and groundwater rights in the project basins. The NPS respectfully requests that the following language (presented in italics) be included in this discussion in the final EIS to address these issues: "The number of surface water rights located in areas where impacts to surface water resources could occur and number of groundwater rights located within the areas where the model simulations indicate drawdown of 10 feet or more are listed in Table 3.3.3-1. There are a large number of existing surface water and groundwater rights located in areas where impacts from drawdown could occur under both the No Action and groundwater development cumulative pumping scenarios. The main difference between the effects posed by the No Action and the groundwater development cumulative pumping scenarios is that existing pumping and reasonably foreseeable future pumping in the project basins has substantially less effect on existing water rights in the project basins than the proposed GWD project pumping. Comparison of the total cumulative pumping results for the Proposed Action and Alternatives A through E in Table 3.3.3-1 with the incremental pumping results for the Proposed Action and Alternatives A through E in Table 3.3.2-22 indicates that approximately 30 percent (Alternatives C and E) to 50 percent (Proposed Action) of the total cumulative effect of pumping on surface water rights in the groundwater model area is attributable to the proposed GWD project pumping. Similarly, comparison of the total cumulative pumping results for the Proposed Action and Alternatives A through E in Table 3.3.3-1 with the incremental pumping results for the Proposed Action and Alternatives A through E in Table 3.3.2-22 indicates that approximately 17 percent (Alternative E) to 40 percent (Alternative B) of the total cumulative effect of pumping on groundwater rights in the groundwater model area is attributable to the proposed GWD project pumping. Similar to the incremental effects analysis, the model results indicate that the cumulative drawdown for the two alternatives with the largest groundwater withdrawal rate (Proposed Action and Alternative B) could potentially impact the largest number of water rights in the modeled area. Comparison of the total cumulative pumping results for the Proposed Action and Alternative B indicates that the application of re-distributed pumping by itself under the Proposed Action would likely be ineffective over the long-term at reducing the degree of impacts to surface water and groundwater rights in some of the project basins, as the number of impacted water rights increases with time under the Proposed Action. However, compared with the results for the Proposed Action and Alternative B, the combined deployment of distributed and reduced pumping modeled for Alternative A would appear to be somewhat effective in reducing the number of surface water and groundwater rights potentially at risk from drawdown effects. Further reduction in pumping and/or elimination of pumping under Alternatives C, D, and E pumping scenarios would further reduce the extent and/or magnitude of the drawdown area compared to Alternative A, and would potentially impact smaller numbers of surface water and groundwater rights in the region. Alternative D pumping appears to have the smallest cumulative impact on surface water rights in the modeled area, while Alternative E pumping appears to have the smallest cumulative impact on groundwater rights in the modeled area. Finally, considering the simulated drawdown under all of the groundwater development pumping scenarios and the hydrogeologic setting, there is a moderate to high risk that cumulative pumping under all of the scenarios could eventually result in reducing or drying up artesian flows that sustain Shoshone Ponds. The reduced drawdown areas resulting from the other alternatives (Alternatives A through E) would decrease the number of water rights impacted. Potential impacts to individual water rights are the same as discussed under the Proposed Action (Section 3.3.2.9). Cumulative impact results presented in Tables F3.3.13-1B through F3.3.13-7B (Appendix F3.3.13) indicate that for the Proposed Action, and Alternatives A, B and C at the full build out plus 200 years time frame, the greatest cumulative impacts to surface water rights would generally occur in Spring Valley (HA 184) (65-127 rights) and Snake Valley (51-64 rights). The results indicated that for Alternative D at the full build out plus 200 years time frame, the greatest cumulative impacts to surface water rights would generally occur in Spring Valley (HA 184) (50 rights), Spring Valley (HA 201) (42 rights), and Lake Valley (36 rights). Results indicated that for Alternative E at the full build out plus 200 years time frame, the greatest cumulative impacts to surface water rights would generally occur in Spring Valley (HA 184) (81 rights). For the No Action alternative at the full build out plus 200 years time frame, the results indicated that the greatest cumulative impact to surface water rights would generally occur in Lake Valley (33 rights), Spring Valley (HA 201) (32 rights), Clover Valley (31 rights), Lower Meadow Valley Wash (25 rights), and Patterson Valley (22 rights). Cumulative impacts to surface water rights in the five project pumping basins under the No Action alternative at the full build out plus 200 years time frame were negligible, with Spring Valley (HA 184) (14 rights) being the only basin where measureable effects from combined existing pumping and reasonably foreseeable future pumping were observed. This result confirms that cumulative impacts to surface water rights in the five project pumping basins are almost exclusively due to the GWD project pumping in these basins. Cumulative impact results presented in Tables F3.3.15-1B through	Please see Standard Resource Response WR-1, specifically the language related to model refinement, and MM-1 related to monitoring, managmement and mitigation. In addition, please see Gen-1 which discusses programmatic analysis and subsequent NEPA.

Comments and Responses - Federal Government

ID	Comment	Response
	F3.3.15-7B (Appendix F3.3.15) indicated that for the Proposed Action, and Alternatives A, B and C at the full build out plus 200 years time frame, the greatest cumulative impacts to groundwater rights would generally occur in Snake Valley (133-104 rights) and Lake Valley (112 rights for all scenarios). The results indicated that for Alternative D at the full build out plus 200 years time frame, the greatest cumulative impacts to groundwater rights would generally occur in Lake Valley (112 rights), Panaca Valley (87 rights), and White River Valley (77 rights). Results indicated that for Alternative E at the full build out plus 200 years time frame, the greatest cumulative impacts to groundwater rights would generally occur in Lake Valley (112 rights), Panaca Valley (87 rights), White River Valley (77 rights) and Spring Valley (HA 184) (66 rights). For the No Action alternative at the full build out plus 200 years time frame, the results indicated that the greatest cumulative impact to groundwater rights would generally occur in Lake Valley (97 rights), Panaca Valley (87 rights), and White River Valley (77 rights). Cumulative impacts to groundwater rights in the five project pumping basins under the No Action alternative at the full build out plus 200 years time frame were negligible, with Spring Valley (HA 184) (17 rights) being the only basin where measureable effects from combined existing pumping and reasonably foreseeable future pumping were observed. This result confirms that cumulative impacts to groundwater rights in the five project pumping basins are almost exclusively due to the GWD project pumping in these basins." The NPS believes these changes are necessary to provide a more in-depth and balanced interpretation and consistent summary of repeatable trends and important results from one alternative scenario to the next.	

Comments and Responses - Federal Government

ID	Comment	Response
34679-245	In the discussion under the minor subheading titled Impacts to Water Balance, the NPS respectfully requests that the BLM present additional discussion summarizing the potential effectiveness of the proposed mitigation measures in reducing the degree of groundwater discharge to evapotranspiration in the project basins, and groundwater flow to Pine, Wah Wah and Tule Valleys, and Fish Springs. This additional discussion is important to give the reader additional context on the potential effectiveness of the proposed mitigation measures, as this has been overlooked or downplayed in the current discussion. The NPS respectfully requests that the following language (presented in italics) be included in the first and second paragraphs of this discussion in the final EIS to address these issues: "Potential changes in the water balance for the groundwater system within the region of study were estimated using the groundwater flow model (SNWA 2010b). The estimated reductions in groundwater discharge to the ET areas for selected basins and flow systems are summarized in Table 3.3.3-1 and illustrated in Figure 3.3.3-11. The model simulations indicate that the combined groundwater withdrawal from existing and reasonable foreseeable future pumping included in the No Action cumulative pumping scenario would have a relatively small effect on the groundwater discharge to ET areas in the Great Salt Lake Desert Flow System. For Spring Valley, the No Action pumping is estimated to result in a 6 and 9 percent reduction of groundwater discharge for ET at the full build out plus 75 years and full build out plus 200 years time frames, respectively. In Snake Valley, the No Action pumping is estimated to result in minimal reductions (<4 percent) of groundwater discharge to support ET. These results confirm that the cumulative impacts to the reduction of groundwater discharge for ET in the five project pumping basins are almost exclusively due to the GWD project pumping in these basins. The Proposed Action would result in the largest reductions in groundwater discharge to the ET areas within Spring and Snake Valleys; with estimated reductions of up to 86 percent in Spring Valley, and up to 35 percent in Snake Valley. For Snake valley, most of the reductions of groundwater discharge to ET areas would occur in the south portion of the valley. Comparison of the results for the Proposed Action and Alternative B indicates that the application of re-distributed pumping under the Proposed Action has the negative tradeoff of increasing the percent reduction in groundwater discharge to ET in these two valleys and the Great Salt Lake Desert Flow System, as well as further reducing groundwater flow to Pine, Wah Wah and Tule Valleys, and Fish Springs. This suggests that re-distribution of pumping by itself would likely be an ineffective mitigation measure to lessen the pumping impacts to natural groundwater discharge to ET in these areas and nearby Utah water resources posed by pumping under Alternative B. However, compared with the results for the Proposed Action and Alternative B, the combined deployment of distributed and reduced pumping modeled for Alternative A would appear to be effective in lessening the pumping impacts to natural groundwater discharge to ET in Spring Valley and the Great Salt Lake Desert Flow System, but not in Snake Valley; as well as lessening the impacts on groundwater flow to Pine, Wah Wah and Tule Valleys, and Fish Springs. Further reduction in pumping and/or elimination of pumping under Alternatives C, D, and E pumping scenarios would further lessen the pumping impacts to natural groundwater discharge to ET in most of these areas and on groundwater flow to Pine, Wah Wah and Tule Valleys, and Fish Springs, compared to Alternative A. The model results indicate that Alternative D would have the least cumulative impact to the ET areas in Spring Valley because the pumping is concentrated in the south end of the valley away from much of the ET areas. This result is similar to the reduction in cumulative impacts to perennial springs and streams in Spring Valley observed under Alternative D. The concentrated pumping under Alternative D results in the deepest drawdown cone indicating that a higher percentage of the groundwater withdrawn under this scenario is from storage compared to the other groundwater development alternatives. The model results indicate that Alternative E would result in the smallest cumulative impacts to the ET area in Snake Valley and on groundwater flow to Pine, Wah Wah and Tule Valleys, and Fish Springs." The NPS believes these changes are necessary to provide a more in-depth and balanced interpretation and consistent summary of repeatable trends and important results from one alternative scenario to the	Please see Standard Resource Response MM-1 related to monitoring, managmement and mitigation. In addition, please see Standard Resource Response Gen-1 which discusses programmatic analysis and subsequent NEPA.
34679-246	The NPS respectfully requests the BLM to include Rowland Spring on Figure 3.5-3, as this is one of the largest springs in the park in terms of volume and which is within an area likely susceptible to groundwater withdrawal according to Elliot et al (2006).	Thank you for your comment. This figure shows only springs classified as being of biological interest and Rowland Spring was not classified in that manner.
34679-247	The NPS respectfully requests that the ROWs be accurately portrayed on Figure 3.5-6. This figure shows that phreatophytes north of the town of Baker and in north Spring Valley would be affected by the groundwater pumping, so why don't the ROWs go to these areas? It seems that if the phreatophyte impact is being analyzed in this detail, then the ROW should also be sufficiently detailed.	Thank you for your comment. The intent of Figure 3.5-6 is to depict vegetation and hydrology potentially impacted by drawdown. Within the Vegetation Section of the EIS (3.5) pipeline and powerline ROW's, as well as groundwater development areas, are depicted in Figure 3.5-1, Land Cover. Detailed maps of the ROWs and GWDs are also located in Chapter 2 of this EIS. Phreatophytes north of the town of Baker are being impacted, not due the location of the pipeline ROW (conveyance), but rather because of proposed groundwater development (pumping) in this area.
34679-248	It appears that the No Action alternative does not take into consideration that other projects like wind farms and transmission lines would influence vegetation communities. Do the cumulative effects take these other projects and their impacts into consideration?	The cumulative effects analysis accounts for the effects of renewable energy projects that have been specifically proposed.
34679-249	The NPS respectfully requests that the cumulative impacts section needs to include the disturbance caused by wind farms and associated new roads.	Known wind farms (esp. Spring Valley Wind) was included in cumulative estimates of surface disturbance. See Page 2-95.

Comments and Responses - Federal Government

ID	Comment	Response
34679-250	The NPS requests that the acronym GBNP be included in the Quick Reference listing.	GBNP has been added to the Quick Reference Guide listing.
34679-251	The NPS respectfully requests the BLM to address the apparent ambiguity on temporary construction water use in the discussion under Construction Water Use. In the first paragraph under Construction Water Use, the fourth sentence says, “No diversion of modification of surface water flows…” Then the next sentence states “any change in water use…” If there is expected to be a change in water use than the fourth sentence in this paragraph should be deleted.	The paragraph in the FEIS has been edited to clarify temporary construction water use potential impacts.
34679-252	The NPS notes that the second sentence on page 3.6-34 states, “…displacement of big game species would create some unquantifiable reduction in wildlife populations.” Aren’t models available to predict what would happen?	BLM is not aware of a model to quantify indirect reductions in wildlife populations.
34679-253	The proposed mitigation for big game key habitat is “SNWA shall improve 2 acres of comparable habitat for every 1 acre of disturbed habitat.” Is this mitigation even possible? It would be appropriate to share some study literature that supports this is a viable option.	The Ely District Approved Resource Management Plan includes this in Appendix A, Page 35, WL-4.
34679-254	In the second paragraph about the discussion on Western Burrowing Owl, BLM makes a reference to “avoidance….using construction fencing.” Although burrowing owl will hunt from a perch, they often run, hop, and glide low to the ground. A fence would restrict their movement, causing reduction in prey availability, fledging dispersal, and habitat fragmentation. As a result, the NPS believes it would be better to go with no fence.	Thank you for expressing your concerns regarding methods for protecting western burrowing owl. Please note that western burrowing owl is a species protected under MBTA. The USFWS will provide appropriate review of the proposed Applicant Committed Measures and other mitigation measures included in the FEIS.
34679-255	In the discussion under Adaptive Management Measures, the mitigation measure proposed under the fifth bullet needs further substantiation that it will work. Where has it been tested that seeding after loss of phreatophytic communities results in establishment of another vegetation type? Seeding success is very low in the Great Basin and Mojave deserts, and the communities that have established in certain areas have evolved to soil types, soil moisture, pH and other specific conditions. The risk of invasion by nonnative or invasive species after disturbance is very high resulting in the elimination of suitable wildlife habitat and increased fire risk.	Thank you for your comment. Please see Standard Resource Response MM-1.
34679-256	The NPS respectfully requests the BLM to provide more specifics about who will be responsible for maintaining the artificial water sources, and where the source of this water will come from.	Text has been added to specify SNWA will maintain and provide water from SNWA allocations.
34679-257	The NPS is concerned that the project proposal has not been adequately characterized for thorough analysis of the stream habitats and aquatic species in the vicinity of the pipeline ROWs. Although Snake Creek is the only perennial stream crossed by the pipeline ROW, as shown, in order to reach the proposed points of diversion and groundwater development areas north of Baker, the ROW would also cross the perennial streams of Baker/Lehman, Strawberry, and Silver Creeks. This is a problem throughout this chapter, and is based on an inadequately characterized project proposal in Chapter 2. Having groundwater development areas so far north of the pipeline terminus in Snake Valley means that the pipeline has not been appropriately sited and that analysis of all the effects is not forthcoming in this draft EIS.	The pipeline ROW only crosses one perennial stream, Snake Creek, while the power line ROW crosses two perennial streams, Snake Creek and Steptoe Creek. The connection of the pipeline ROW with well fields has not been defined at this time, and so a programmatic approach was used for the groundwater development phase of the project. Subsequent NEPA analyses will evaluate specific connector ROWs, roads, and well fields.
34679-258	The fourth sentence under the heading titled Conclusion states, “The BLM BMPs would reduce impacts by limiting road access across streams…” What exactly does this mean? Would the road size be limited? Would the number of roads across streams be limited? Would the amount of traffic on the roads be limited? The NPS respectfully requests the BLM to provide further clarification on this statement.	The BMP means that the number of road crossings on perennial streams would be minimized during construction.
34679-259	The NPS respectfully requests the BLM to provide clarification on whether the pipeline stream crossing of Snake Creek would also include a road crossing. In other places in the document, it states that a road would follow the entire length of the pipeline. If so, would this road crossing be a ford across Snake Creek? If so, it would have long term impacts on water quality.	A temporary stream crossing would be required at the Snake Creek pipeline and power line ROW intersections with the stream. No permanent road across Snake Creek would be required. vehicles and equipment may ford the stream. A temporary crossing would not result in long-term impacts on water quality.
34679-260	In the discussion under the heading titled Conclusion, the NPS respectfully requests the BLM to include potential mitigation to address in-stream disturbances. In the conclusion, it is stated that “in-stream disturbance…could disturb spawning activity and alter spawning habitat for brown trout. No RMP management, direction BMPs, or ACMs are available to reduce impacts on trout spawning in Snake Creek.” What about requiring no construction in the Fall?	Mitigation measure ROW-AB-3 would restrict construction in Snake Creek during the fall spawning period.
34679-261	The NPS respectfully requests the BLM to provide additional mitigation measures to protect riparian birds during construction. Breeding birds along the riparian habitats are not considered in the draft EIS. These birds could be severely disrupted if construction takes place in late spring/early summer (April-June). Mitigation measures need to be incorporated, for example, if construction is going to occur in the spring, to check for breeding bird nest construction.	Effects of construction on riparian habitat and breeding birds is addressed in Section 3.6, Terrestrial Wildlife.
34679-262	The NPS respectfully suggests that construction should be avoided during high water (May-August) to avoid substantial impacts to water quality.	As discussed in the Water Quality Effects section, construction would occur during the low flow period.

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ID	Comment	Response
34679-263	The NPS respectfully requests the BLM to provide clarification on the potential effectiveness of the adaptive management measure ACM C.2.6. ACM C.2.6 states, “Conduct habitat enhancement for springsnails in Snake Valley by restoring natural fluvial morphology of spring flow systems.” First, which springs are targeted? Second, do these springs not have natural fluvial morphology? Who has evaluated them? Third, what studies have shown this to be an effective mitigation measure?	The ACMs are measures that are committed by the applicant and considered part of the Plan of Development. The BLM cannot require the applicant to modify these measures. Additional mitigation can be recommended in the EIS to further reduce impacts to environmental resources. Additionally, please see the discussion of the COM Plan in section 3.20 of the FEIS.
34679-264	The NPS respectfully requests the BLM to justify the 1-mile buffer distance established for the fourth bulleted issue. The issue states “Residences within 1 mile of ROWs and ancillary facilities could be affected by pipeline and power line construction, operation, and maintenance.” With the long views in many parts of the project area, it is likely that a 1-mile buffer is not large enough. How was this 1 mile buffer determined?	A distance of 1 mile was used to assess direct and indirect land use impacts. Impacts to residences from sound and sight are addressed in those respective sections.
34679-265	The NPS requests the BLM to correct to discussion about caves in Great Basin National Park to reflect the caves most visited in the park. Within the Lehman Creek watershed, please delete the caves Lehman Annex and Root—these have never been permitted caves.	Corrections have been made in the FEIS in response to this comment.
34679-266	Whipple Cave is not in Cave Valley, but rather south of Lund in White River Valley. Cave Valley Cave is in Cave Valley.	Thank you for your comment. This correction has been made in the EIS.
34679-267	The NPS respectfully requests the BLM to address inconsistencies the NPS sees with the analysis of effects on GBNP resources. It is stated, “ACM – SNWA has recognized and agreed to “avoid any effect on federal resources within the boundaries of the GBNP from groundwater withdrawal by SNWA” (Appendix C).” Then the Conclusion which directly follows states that “Groundwater drawdown is projected to be greater than 10 feet for some springs and perennial streams in GBNP.” Furthermore, on the next page under REC-4, the draft EIS states that “Prior to BLM issuing a ROW and/or notice to proceed for the Snake Valley lateral, additional data and analysis will be completed to identify if impacts from the proposed project will occur, and if so, the magnitude and extent of those impacts to the resources of the GBNP.”It appears that while some analysis is showing that park resources will be impacted, the BLM does not want to conduct additional analysis at this time. Is this consistent with NEPA?	The groundwater drawdown model analysis at this scale has indicated that effects to springs and streams within the boundaries of GBNP are possible; however, development of that portion of the project would not occur for approximately 30 years. Therefore, while this EIS discloses anticipated project impacts using available information, a more accurate depiction of those impacts would occur in subsequent NEPA. Tiering is allowed under NEPA regulations, per 40 CFR Sec. 1508.28. Also please see the response to GEN-8.
34679-268	Tables 3.9-16 through 3.9-20 list several recreation areas where effects to perennial springs and streams could occur. Why isn’t GBNP included as a recreation area in these tables? Table 3.3.2-8 in Section 3.3 (Water Resources) clearly identified several springs and streams in the park that could be potentially impacted by the GWD project pumping.	Some information was inadvertantly deleted from the tables in the recreation section, but the information was included in the body of the DEIS text. The information has been added back into the tables.
34679-269	Examination of the timing of pipeline and facility construction activities in Table 3.10-3 indicates the timing is inconsistent with similar tables presented in the draft EIS. The Snake Valley North and South facilities and lateral are shown to be constructed from 2020-2022. In other parts of the document, it is stated that groundwater pumping in Snake Valley would not begin until 2050. Why would these facilities and the pipeline be built 30 years prior to their intended use?In addition, on page 3.18-65, Table 3.18-36, it states that the timing of production well and collector pipeline development in Snake Valley would be 2047 to 2049. The dates for Spring Valley do not match either between Tables 3.10-3 and 3.18-36.	Thank you for your comment. The inconcsistency in timing between Table 3.10-3 and other tables was a simple editiorial oversight during report preparation. The underlying schedule in terms of duration and locationof activities in Table 3.10-3 is consistent with the other tables. Year specific references for project development activities have mostly been replaced in the FEIS due to uncertainties associated with the timing of SNWA's submittal of a revised ROD, project financing and other factors.
34679-270	Clarification needed. The text states in the fourth line “…a net decline in Clark County’s population between 2009 and 2010.” This is not reflected in Fig 3.18-3, which shows an increase from 2009 to 2010. Were these numbers on the graph a projection?	As indicated in the text, expectations at the time were for a net decline. The text also notes that subsequent estimates didn't substantiate the expectation. The data in Figure 3.18-3 portray the actual estimates.
34679-271	Both the Ely field office and the Fillmore field office are in the process of redoing their VRI and VRM. This should be disclosed in the discussion under Land Use Plans, as the potential impacts to the areas in development areas are likely to be impacted.	The current status of the Southern Nevada and Ely District VRIs has been updated in the Visual Resource section, and the best available BLM inventories and management objectives have been considered in the impact analysis. At the time of publishing the FEIS, the BLM had not modified VRM classes from the DEIS.. The Fillmore Field Office VRI or VRM classes are not affected by surface disturbance in the proposed ROWs and GWDs, and are therefore excluded in the FEIS.
34679-272	VRI classes are inappropriately defined as most to least valued. According the BLM VRM guidance, these classes are instead indicative not of their current condition, nor value, but on the amount of development and disturbance that the BLM will authorize to occur. For example, most of Hamlin Valley is undisturbed, contains broad views of both the valley and surrounding mountain ranges and would be characterized by most people as scenic. The BLM, however, defines most of this area as Class IV, and would allow nearly unlimited impacts to visual resources. This should be properly disclosed. Figure 3.15-1 correctly labels the classes as preservation-modification, not because the areas are currently undisturbed but because the BLM is willing to sacrifice scenic viewsheds in those areas.	The VRI portrays the relative value of the visual resources and serves as a baseline for analysis of impacts associated with the various alternatives in this project. BLM considers scenic quality, sensitivity levels and distance zones during the VRI process. The VRI provides a snapshot in time of the current scenic values of an area without consideration of jurisdiction, manageability, existing leases, pending or approved projects, or other resource opportunities or constraints (i.e., wildlife habitats, mineral and energy potential, etc.). VRI Classes are informational in nature. They do not establish management direction and should not be used as a basis for constraining or limiting surface disturbing activities. VRI Classes are described by the BLM as representing the relative value of the visual resources; Classes I and II being the most valued, Class III representing a moderate value, and Class IV being of least value. VRI Class IV (as in Hamlin Valley) is based on combination of scenic quality, sensitivity levels, and distance zones. VRM Classes as defined by the BLM are indicative of the amount of development and disturbance the BLM will authorize to occur. VRM Class IV does provide for major modifications of the existing character of the landscape; however, all impacts will be mitigated to the extent feasible regardless of the designated VRM Class. VRI and VRM designations and the BLM management of these areas are disclosed in Section 3.15.1.1. No change to the FEIS.

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34679-273	The NPS respectfully recommends that BLM ACEC's should be included in this list, as well as the consideration of VRM impacts to the ACEC's.	Mormon Mesa and Coyote Springs ACECs are within affected viewsheds, and are added to the list. Other ACECs are included in the list without the ACEC designation, and are revised to include the ACEC designation. Scenic values as a primary resource value of ACECs with views of project were identified from BLM field office data; only Kane Springs had a scenic value component and had views of the project. Mormon Mesa, Coyote Springs, and other ACECs within affected viewsheds do not include scenic values as a primary resource value protected under the ACEC designation.
34679-274	The NPS appreciates the inclusion of additional KOPs within Great Basin National Park. However the NPS considers this an incomplete analysis that does not fully consider or disclose the impacts to visual resources due to incorrectly or incompletely placing KOPs in representative areas. As the NPS noted in our comments to the earlier administrative draft review of the draft EIS, an analysis and full disclosure of what an average park visitor might see under the different project alternatives was not done.	The GBNP is 2.7 miles from nearest project component in Spring Valley and 8.5 miles from the nearest project component in Snake Valley. Photographic simulations are not feasible to produce at this distance. Representative simulations from KOPs closer to project provide greater detail and are sufficient to disclose impacts to the GBNP. KOP and photographic simulation locations were identified by the BLM. A viewshed analysis has been prepared to identify those areas of the GBNP that would have views of the project. The viewshed analysis figure has incorporated into Appendix F3.16 – Visual Resources.
34679-275	As the NPS noted in our comments to the earlier administrative draft review of the draft EIS, no analysis of the cumulative impact has been done except to state that impacts will be greater. The NPS respectfully request that the BLM fully analyze the impact of the proposed action and RFFA by including: (1) the VRI of each valley or valley segment; (2) the VRM for each valley or valley segment (done); (3) a representative KOP that captures, in a reasonably wide view, an area in each valley that will be impacted by the proposed action and/or alternatives; (4) develop simulations showing the proposed action or alternatives; and 5) the same simulations showing proposed action and RFFA's.	Cumulative impacts to visual resources are summarized in Table 3.15-13 Cumulative Long-term Visual Impacts from Past, Present, and Reasonably Foreseeable Activities in Study Area Basins Containing Proposed Project ROW and GWD Activities. The narrative text provides detail for the types of projects considered in the cumulative analysis (i.e., wind, solar) and the visual effects typical of these types of projects. Simulations of the cumulative effects, including groundwater development, were not completed because GWD facilities have not been sited and because the information for preparing the depictions (design and location) is not available for various types of projects in the cumulative analysis area.. Please also see Standard Resource Response Gen-1 for a discussion of future facility tiering.
34679-276	Snake Valley represents the gateway community to Great Basin National Park. Throughout the document, no clear connection is demonstrated in the socio-economic nexus that exists between Great Basin National Park and the communities of Snake Valley (Baker, Garrison, EskDale and Callao). Taken together, the availability of housing, the economic connections, as well as the social connections, will all be harmed if either part is impacted by the proposed pipeline. The potential loss of agricultural productivity in Snake Valley due to decreased water availability will indirectly impair park development. Snake Valley must maintain a viable economic base if Great Basin National Park is to prosper and vice versa. Any limitations introduced in the future development of Snake Valley will also impact on the park's future.	Thank you for your comment. The economic and social linkages and interdependencies between the GBNP and Snake Valley residents and communities are addressed in several locations in Section 3.18. However, the underlying subject of this comment relates to the allocation of water resources in Nevada and the potential implications of those allocations for the Snake Valley. Those allocations are outside the scope of BLM's authority in reviewing SNWA's application for a ROW. As noted in the Executive Summary (paragraphs 2.7 and 2.8), Section 1.4 and elsewhere, the responsibility for administering water in Nevada rests with the Nevada State Engineer, with consideration of existing water rights and the public interest among the factors to be considered in future water rights appropriations. Furthermore, as noted in Section 1.3.1 the LCCRDA requires agreement between Nevada and Utah on the diversion of water resources from interstate groundwater flow systems.
34679-277	For White Pine County Fire Departments, insert (volunteer) after Snake Valley [Baker]; The Snake Valley Volunteer Fire Department is the same as the Baker Volunteer Fire Department. Garrison Volunteer Fire Department is separate and located in Millard County.	Thank you for providing the factual clarification. The text in the FEIS has been revised accordingly.
34679-278	This paragraph is accurate. With an influx of construction workers that could quadruple the population of southern Snake Valley, mitigation would be necessary to ensure emergency services needs would be sufficient, such as designated construction workers being trained and donations to the local community. The NPS requests that specific mitigation measures be added to this discussion to address the potential increase in emergency services that might result from the temporary influx of construction workers to the area.	The existng proposed mitigation measure SE-2 addresses the issue of emergency services, proposing coordination with the respective County Commissioners for White Pine and Millard Counties. The County Commissioners were identified as the appropriate parties because they are the designated administrative authority for the Snake Valley given an absence of incorporated municipalities. Nonethe less, SE-2 has been revised to include local emergency service providers in the proposed coordination actitivity.
34679-279	Table 3.20-1 is incomplete. Monitoring for paleontological resources described in Ch. 3.2 should be added to this table for quick reference or it might be forgotten.	No additional mitigation is recommended for paleontological resources. Applicant-committed measures (ACMs A.6.1, A.6.2, and A.6.3) would be implemented to protect paleontological resources, as described in Appendix E. ACMs are not included in Table 3.20-1.
34679-280	Footnote #5 is missing	Footnote #5 is located on p. F3.2-1, Appendix F3.2. The footnote was inserted.
34679-281	The NPS respectfully requests the BLM to include the number of well samples and spring samples that are being summarized in these tables.	This supplemental detail is provided in the baseline report (SNWA 2008) that was incorporated by reference in this appendix and is provided on the CD distributed with the FEIS.