Standard Resource Responses

Common ID		Standard Response
General		
Gen-1	Tiering and Programmatic Assessment	This Final EIS specifically addresses the effects associated with the action in question (request for a ROW grant) and more broadly (programmatically) addresses the environmental effects of future facilities and groundwater drawdown. The latter sets the stage for subsequent treatment under NEPA when rights-of-way for future phases of the GWD Project are requested and additional and more detailed information becomes available. Appropriate subsequent NEPA analyses will be completed prior to construction of future facilities. Some commenters maintain that issuance of the EIS is premature, and that the NEPA process cannot occur until more project-level information, such as all well locations and collector pipelines, are known and site-specific data compiled. NEPA requires that an agency identify incomplete or unavailable information. Chapter 3.0 identifies incomplete and unavailable information. Information pertaining to the locations of production wells and collector pipelines is not available at this time due to the long lead-time required to develop each phase of the project. See EIS **Figure 2.5-6** (project timeline showing multi-decade phased nature of the project). NEPA requires integrating the NEPA process early in the project planning and development process. The BLM considered the earliest appropriate time to incorporate NEPA into the project planning and development process to be the project-specific evaluation of the main pipeline and related support facilities, and programmatic evaluation of the collector pipelines and pumping related facilities. For the project-specific main pipeline project, the BLM has conducted a detailed evaluation of project impacts. For the programmatic evaluation of future phases of the project (i.e., production wells, collector pipelines, and related facilities), the EIS considered a range of possible volumes of groundwater withdrawal, thus ensuring the most extensive programmatic level evaluation of groundwater development. The BLM's use of the programmatic or "tiered" approach to NEPA for GWD Project future facilities and groundwater pumping, EIS Section 1.3.3, ensures that the programmatic analysis considers the full range of potential regional impacts based on available information and adequately informs BLM's decision whether to approve the initial right-of-way request. Future site-specific tiered review will focus on the issues ripe for decision and incorporate additional information that may become available. The BLM's programmatic approach to NEPA impact analysis, given the multi-year, multi-staged nature of the GWD Project, is reasonable and comports with NEPA's goals of ensuring informed agency decision-making and public participation. If BLM decides to grant a ROW for the main pipeline facilities based on both the project-level NEPA evaluation of the main pipeline project, and the programmatic NEPA evaluation of the remaining facilities, BLM retains discretion whether to and subject to what conditions it will grant future ROW requests for groundwater production wells and associated facilities. BLM will meaningfully consider new information and the potential effects of subsequent proposals and grant, deny, or grant subject to condition any ROW for location of future facilities on federal land. BLM also will consider existing and/or additional mitigation measures relevant to each subsequent proposal. NEPA does not require that BLM await the development of every potential source of information or that all phases of a multi-staged project be precisely defined before proceeding with a decision on the first phase of the project.
Gen-2	Tiering	Tiering is a staged approach to NEPA described in CEQ's Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR 1500 – 1508). Tiering allows the agency to broadly address known actions to determine specific impacts while addressing related actions programmatically in initial (Tier 1) analyses. Programmatic analysis is any type of analysis and documentation from which subsequent NEPA documents are tiered, while the word program describes a specific type of programmatic document (National Environmental Policy Task Force 2003). This Tier 1 Environmental Impact Statement (EIS) is the vehicle for fact-based analyses that support informed decision-making on ROW-related (surface disturbance) impacts and programmatic analysis of groundwater-related construction, operation, and pumping. This tier includes the development of a Tier 1 Draft EIS, a Tier 1 Final EIS, and a Tier 1 Record of Decision (ROD). The ROD will present the BLM's decision related to the Tier 1 analysis and will include specific direction for decision-makers on future actions related to this project. The tiered process supports decision-making on issues that are ripe for decision and provides a means to communicate the intent of the decision-maker for the Tier 1 document, preserve those decisions, and provide goals and direction to future decision makers.

Standard Resource Responses

Common ID		Standard Response
Gen-2 (Continued)		Generally, it is appropriate to tier to a NEPA document for a broader action when the narrower action is clearly consistent with the decision associated with the broader action. Due to the size of the area of potential effect and inability to perform analyses at the appropriate level to determine specific impacts, a programmatic analysis followed by subsequent tiered NEPA is appropriate at this project stage. Information used for Tier 1 analysis (e.g., groundwater modeling) will be performed at a more local and detailed level for subsequent tiers to increase the specificity of the analysis. Upon completion of the Tier 1 study, future NEPA review associated with groundwater development will provide analysis for decisions on specific, related future actions that could include the construction of the following and other required facilities: • Groundwater Production wells; • Collector Pipelines; • Access roads; • Pumping Stations; and • Power Facilities including overhead power lines, electrical substations, and hydro-turbine energy recovery facilities. National Environmental Policy Task Force 2003. Report to the Council on Environmental Quality. Modernizing NEPA Implementation. http://ceq.hss.doe.gov/ntf/report/finalreport.pdf. Accessed 2/27/2012.
Gen-3	Alternative selection	The action before the BLM is a right-of-way (ROW) application for groundwater conveyance. The processing of a ROW application does not require the BLM to identify and evaluate alternative water source options to address SNWA's anticipated needs. BLM did, however, consider other water resource alternatives suggested by the public during scoping, although none were carried forward for detailed consideration. BLM considered a number of factors in determining whether to carry forward proposed water supply and other alternatives for detailed consideration, including consistency with BLM's basic policy objectives and whether the alternative met BLM's purpose and need and was consistent with SNWA's goals and objectives. See EIS Section 2.7, Table 2.7-1.
Gen-4	Comment period extensions	Thank you for your comment. The BLM extended the comment period on the Draft EIS by 30 days in response to requests such as yours.
Gen-5	Range of alternatives	The BLM carefully considered the input from the public and other agencies in determining which alternatives to carry forward for detailed consideration. The alternatives cover a wide range of ROW location and pumping options. An additional alternative (F) has been added to the analysis for this Final EIS to expand the range of alternatives analyzed.
Gen-6	Agency-preferred Alternative	Your comment has been reviewed and considered by the BLM in its choice of the agency-preferred alternative presented in this Final EIS.
Gen-7	Concerns regarding the continuation of mitigation and monitoring in the long term	Thank you for expressing your concerns regarding assurances that long-term mitigation and monitoring would continue throughout the life of the ROW. The BLM has provided a framework for long-term monitoring and mitigation as part of the Construction, Operation, Maintenance, Monitoring, and Mitigation Plan (COM Plan) (see EIS, Chapter 3.20). Long-term monitoring and mitigation also is required under the Stipulated Agreements (see Appendix C) and these requirements may be incorporated in future agreements between the BLM, SNWA, and other federal agencies and the states of Nevada and Utah as appropriate. In turn, compliance with the COM Plan and other plans and agreements would be incorporated as conditions into ROW grants issued to SNWA. Failure to comply with those conditions would place SNWA in noncompliance, which could result in a suspension of the ROW. If the ROW is suspended, SNWA would not be allowed to operate its ROW until it achieved compliance and received a notice to proceed from the BLM. Additionally, until SNWA brought the ROW into compliance, the BLM would not issue additional or renew existing ROW grants and exploration permits. Text explaining the conditioning of a ROW grant on continued compliance with BLM enforceable mitigation has been included in Chapter 1.0 and is covered by 43 CFR 2807.16 through 2807.19.
Gen-8	Project costs and BLM's authority related to costs and land use over time.	Thank you for your comment. The BLM acknowledges that the availability, use, and cost of water resources are important public policy issues warranting public dialogue, particularly in arid climates. As stated in Section 1.3.2, groundwater resources in Nevada are administered by the state of Nevada, not the BLM. The regulation, reservation, and prioritization of water providers and utilities in the state are within state authority.

Standard Resource Responses

Common ID		Standard Response
Gen-8 (Continued)		The BLM's responsibility under NEPA requires the agency to be neutral on issues such as this, which is state responsibility. Statements of support or opposition to the project based on the availability, allocation, and cost of water resources in its analysis and subsequent decision regarding SNWA's ROW applications will be included in the administrative record. However, the regional and temporal scale of the analysis, covering over 20,000 square miles, more than 30 hydrographic basins, with assumed pumping extending over 200 years, represents one of the most extensive assessments ever completed by the BLM for a linear ROW corridor EIS. The analysis will help BLM evaluate and develop conditions of approval to prevent unnecessary or undue degradation to the public lands (43 USC § 1732(b)), minimize damage to scenic and esthetic values and fish and wildlife habitat, and otherwise protect the environment (43 USC § 1765(a)). The discussion in Section 1.3 has been revised to clarify BLM's administrative authority and authority related to groundwater or the intrastate public policy issues raised by SNWA's water rights and ROW applications. Chapter 1.0 provides a detailed discussion of FLPMA and other applicable laws and regulations. Changes in land uses resulting from the project are discussed in Section 3.8.
Gen-9	Purpose and Need	Under BLM's NEPA Handbook, "The purpose and need statement for an externally generated action must describe the BLM purpose and need, not an applicant's or external proponent's purpose and need." BLM NEPA Handbook, H-1790-1, Section 6.2 (Jan. 2008). Here, the EIS describes BLM's purpose under FLPMA, LCCRDA, and SNPLMA to consider SNWA's right-of-way request (EIS Section 1.2). The purpose and need also takes into consideration the applicant's goals and objectives, described in Section 1.6. The alternatives considered in detail meet both BLM's purpose and need and SNWA's goals and objectives. Section 2.7 describes why other water supply alternatives were not carried forward for analysis, including that many did not meet BLM's purpose and need or SNWA's goals and objectives.
Gen-10	Inclusion/exclusion of future water rights for the No Action alternative	The No Action alternative is an analysis of what the existing environment will be in the future during the timeframe of the impact analysis, including the effects of predictable actions by others that will take place if the proposed action does not occur (CEQ, Forty Most Asked Questions, 46 Fed. Reg. 18026, 18027 [1981] [Question 3]). Rather than a snapshot of current conditions, the No Action Alternative analyzes potential future conditions in the absence of the Project. Section 2.2.2 explains that the No Action alternative considers the impacts of continued groundwater pumping of existing permitted uses. Appendix C to the Transient Groundwater Model Report describes in detail how historical consumptive water use in the region of study was estimated using a combination of reported groundwater pumping or surface water diversion data and estimates of consumptive water use based on water rights information obtained from Nevada Division of Water Resources and Utah Division of Water Resources. SNWA's 8000 afy of existing water rights in Spring Valley and Lincoln County's 11,300 afy of existing agricultural water rights in Lake Valley are included in the No Action alternative because they are currently being put to beneficial use in those valleys and will continue to be used regardless of the whether BLM grants a right-of-way for the GWD Project.
Air Quality and Climate		
Air-1	Dust contents - Radionuclide	Thank you for expressing your concerns related to potential impacts from windblown dust and radionuclide exposure. BLM does not anticipate that re-suspension and transport of radionuclides from past nuclear testing would occur at levels considered to be harmful to human health. Furthermore, soil testing for radioactive nuclides in the project area has shown that fallout from nuclear testing conducted in the past has decayed to levels that are not considered harmful to human health. For more information on this topic including sampling locations, please refer to Sections 3.1.2 Environmental Consequences of Air Resources, 3.2.1.4 Geologic Resources, and 3.4.1.2 Soil Resources.
Air-2	Dust contents - erionite	Thank you for expressing your concerns related to potential air suspension of erionite and human exposure. Erionite, an asbestos-like material, has not been identified in the project area and is not expected to be an air contaminant resulting from project activities. For more information on this topic, including sampling locations please refer to Sections 3.1.2 Environmental Consequences of Air Resources, 3.2.1.4 Geologic Resources, and 3.4.1.2 Soil Resources.

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Common ID		Standard Response
Air-3	Dust contents - health	Thank you for expressing your concerns regarding potential human health impacts from airborne particulates. The chemical composition of the particulates is anticipated to be primarily soil from eroded crustal material. Soil in the project area may include trace amounts of minerals and metals (see Section 3.4.1); however, as described in Section 3.1.2, the levels of these minerals and metals are not anticipated to be a human health concern when inhaled. For more information on this topic, including sampling locations, please refer to Sections 3.1.1.2 and 3.1.2.1.
Air-4	Dust - creation	Thank you for expressing your concerns related to the potential generation of windblown dust. Continued air quality impacts due to wind erosion of surfaces disturbed during construction would occur, at decreasing levels, until most surfaces are revegetated. See Section 3.1.2.
Air-5	Dust - visibility	Thank you for expressing your concerns related to potential visibility impacts due to groundwater drawdown activities. Windblown dust emissions from groundwater drawdown were assessed with an air quality modeling analysis, including visibility impacts at Great Basin National Park. The model-predicted that visibility at Great Basin National Park would be affected by the project to varying degrees, depending on the alternative. Please see Section 3.1.2 of the Final EIS for more information on predicted visibility impacts to GBNP.
Air-6	Dust - vegetation and wildfire	Thank you for expressing your concerns related to air quality in association with groundwater drawdown. Declines in water availability could affect plant growth resulting in reduced yields. Landscape transformation due to vegetation transition, wildfires, and loss of wetlands along streams also is likely to reduce flood-buffering capacity. For more information on these impacts, see Section 3.5.
Air -7	PM Transport - Modeling and Hinds 1999	In response to this and other similar comments, the estimated project emissions were modeled with an air quality model. Previously, known physical properties of particle motion were used to qualitatively assess limitations of particle transport. Model-predicted air quality impacts are reported and summarized in this Final EIS in Section 3.1.2.
Air -8	PM Transport - Utah/Wasatch Front	In response to this and similar comments, the estimated project emissions were modeled with an air quality model. Model-predicted air quality impacts indicate that project emissions are not anticipated to contribute to nearby PM_{10} or $PM_{2.5}$ nonattainment in areas such as Clark County or the Wasatch Front. For more information on the predicted air impacts to Utah and the Wasatch Front see Section 3.1.2 in the Final EIS.
Air-9	PM transport - Modeling Impact	In response to this and similar comments, the estimated project emissions were modeled with an air quality model. The air quality model was used to assess compliance with health-based National Ambient Air Quality Standards (NAAQS) both near the project area and at distances as far as the Wasatch Front in Utah. In addition, the air quality model was used to assess visibility impacts at Great Basin National Park (GBNP), a Class II area. All other Class I and sensitive Class II areas are located further from the project site than GBNP and, as such, visibility impacts are predicted to be less than at GBNP. Model-predicted impacts for all of these areas are reported and summarized in this Final EIS.
Air-10	PM Transport - Dust Storms, Owens Lake	Thank you for expressing your concerns related to the potential for this groundwater development project to increase the frequency or severity of dust storms. Your comment compared this project's potential impacts to other hydrologic projects that removed surface water. It is not anticipated that the air quality impacts due to this groundwater development project will be similar to air quality impacts observed from water removal from natural lakes. To support this, a modeling analysis of air quality impacts associated with groundwater drawdown was conducted and results are summarized in this Final EIS. Subsequent NEPA likely will include air quality monitoring to measure the actual air quality impacts that may be associated with groundwater drawdown.
Air-11	Vegetation - Wetlands/Meadows	Thank you for expressing your concerns related to windblown dust resulting from changes in wetlands/meadows vegetation types. The methodology used to calculate emissions from these areas was revised. Please see Section 3.1.2.8 of the Final EIS for more information.
Air-12	M&M - Monitoring locations	Thank you for expressing your concerns related to site monitoring locations. The Tooele, Utah monitoring site is influenced by its proximity to Salt Lake City, Utah, which is approximately 15 miles from the monitor. The closest boundary of the groundwater development area is approximately 70 miles southwest of the Tooele monitor (see Section 3.1).
Air-13	M&M - Monitoring locations	Thank you for expressing your concerns related to future air monitoring locations. Determination of the monitoring site locations is beyond the scope of this EIS; however, the monitoring framework will include a procedure for determining monitor locations.

Standard Resource Responses

Common ID		Standard Response
Air-14	Utah - NAAQS	Thank you for expressing your concerns related to Utah's attainment of the health-based NAAQS for 24-hour average $PM_{2.5}$ concentrations. The BLM is aware of Utah's requirements stipulated in the proposed State Implementation Plan, as well as the potential financial implications for the state. Based on the concerns of the State of Utah, transport of project particulate emissions estimated from groundwater drawdown were simulated with an air quality model and potential effects along Utah's Wasatch Front were assessed. Model-predicted air quality impacts are reported and summarized in this Final EIS.
Air-15	Climate Change - General Location/Re-organization, Uncertainty	Thank you for expressing your concerns related to potential future effects of climate change and associated uncertainty. To facilitate information synthesis, the text related to the climate change analysis was reorganized in the Final EIS. Information previously presented in the air resources Section 3.1 has been reorganized into the cumulative effects section of each resource potentially affected by climate change. Section 3.1 still presents an overview of regional climate and potential future trends in the project area, as well as estimates of greenhouse gas emissions associated with the project. It is important to recognize that the current state-of-the art climate change science reflects considerable uncertainties associated with future trends and potential effects to specific regions or species. This uncertainty is qualified in the Final EIS text. In addition, the Final EIS presents potential ranges of changes associated with climate change where sufficient information exists. Please see Sections 3.1.1.4 and 3.1.3 of the Final EIS for more information.
Air-16	Climate Change - H-T	Thank you for expressing your concerns related to potential impacts from climate change. The Humboldt-Toiyabe National Forest Climate Change Vulnerability Report (2011) contains a detailed description of climate change impacts to ecosystems' flora and fauna. The report detailed impacts including examples of flora and fauna for each ecosystem susceptible to temperature and precipitation changes, snow melt and extent changes, invasive species increase, migration, spatial distribution changes, and wildfires. The findings of that report do not contradict the general information presented in the Final EIS. The Final EIS has been revised to reference the report where appropriate.
Air-17	Climate Change - Secretarial Order 3226	In accordance with Secretarial Orders 3289 and 3226, the Final EIS considers and analyzes the potential effects of climate change. Secretarial Order No. 3289 establishes a Department-wide approach for applying scientific tools to increase understanding of climate change and to coordinate an effective response to its impacts on tribes and the land, water, ocean, fish and wildlife, and cultural heritage resources that the Department manages. Secretarial Order No. 3289 also reestablished the requirements set forth in Secretarial Order No. 3226 that each bureau and office of the Department must consider and analyze potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, developing multi-year management plans, and making major decisions regarding potential use of resources under the Department's purview. Secretarial Order No. 3289 did not alter or affect any existing duty or authority of individual bureaus. Consistent with Secretarial Order No. 3289 and Secretarial Order No. 3226, and to the extent possible, the BLM considers and analyzes potential climate change impacts in the EIS. Climate change effects are addressed for all affected resources. In addition, the findings of the Final EIS associated with the project's contribution to climate change were considered when making decisions regarding the selection of the preferred alternative for this project. Finally, the information in the Final EIS will be considered when setting priorities for developing appropriate project monitoring and mitigation plans.
Air-18	Climate Change - Snow	Thank you for expressing your concerns related to the potential influence of climate change on snowfall and snow melt and the potential impact of project-related dust on snow. Information about climate change's potential effect on snow in the project area, including reduction of snow pack, earlier melting of snow, earlier timing of spring runoff, and associated river flows are described in Sections 3.1.1.4 and 3.1.3.1. A discussion of the effect of dust settling on snow pack has also been added to Section 3.1.1.4. Dust impacts to snow are highly variable from year-to-year depending on meteorological conditions, geography, topography, and soil contents. The potential impact of increased dust on snow-covered surfaces is highly uncertain; determining potential effects would require long-term monitoring.

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Common ID		Standard Response
Air-19	Climate Change - Energy Consumption and Calculation of Indirect GHG	Thank you for expressing your concerns related to the project's potential contribution to greenhouse gases (GHG) and use of renewable energy resources options to reduce potential GHG emissions. The estimation of the project's potential GHG emissions includes both the direct emissions of GHGs from construction and maintenance equipment, as well as indirect emissions from the estimated power requirements for the project. Other indirect GHG emissions associated with potential population growth in Las Vegas were not included in the analysis (see Section 3.18 of the Final EIS for more information on this topic). Similarly, other power requirements associated with potential use or treatment of the water is highly speculative and the indirect GHG emissions that may result from these activities could not be quantified. The predicted project-related energy requirements and associated GHG emissions will be offset for all alternatives, in part, by electricity generated by renewable resources that do not emit GHG such as hydroturbines and solar panels.
Air-20	Cumulative Impacts	Thank you for expressing your concerns related to potential cumulative impacts created over time. The cumulative air quality analysis considered the impacts of all Past, Present, and Reasonably Foreseeable Future Actions (identified in Section 2.9) in combination with the project alternatives. It was determined that the cumulative direct and indirect GHG emissions associated with the ROW and groundwater development construction and maintenance are negligible on a regional, national, and global scale and are unlikely to occur at the same time as other actions. However, windblown dust emissions associated with groundwater drawdown from this project, other projects, and the surface disturbance from other projects were combined to assess the cumulative windblown dust impacts. Refer to Section 3.1.3 for further information.
Air-21	Emission Development Methodologies	Based on this and similar comments, the methods for estimating the potential particulate emissions associated with the project construction and long-term operations, including groundwater drawdown, have been revised and included in an air quality model to estimate the transport of the emissions to other areas.
Air-22	Using the air model to make climate change predictions.	Due to the speculative nature associated with calculating emissions for indirect sources related to the use of water, those emissions will not be addressed in this programmatic analysis to make climate change predictions. This issue will be addressed by future NEPA if deemed appropriate at that time.
Water Resources		
WR-1	(a) Model development uncertainty and limitations; (b) Use of the 10-foot drawdown contour to define the drawdown area; and (c) Use of the model simulated changes to flow in selected springs and streams to identify potential impacts; (d) Request for more detailed modeling and site specific analysis of pumping effects.	**Model Development for Programmatic Analysis** As described in Section 1.3 of the Final EIS, details regarding the number and locations of wells and pumping rates are presently unknown. Therefore, the potential long-term effects of groundwater pumping were the subject of a "Programmatic Analysis." In brief, the programmatic analysis is an initial environmental assessment that considers the general characteristics of the proposed activity but is not site-specific. Programmatic assessments typically result in broad characterizations of potential impacts over a wide area or period of time with the expectation that assessments will be refined in subsequent site-specific NEPA analyses. The methodology, assumptions, and limitations used to quantify potential effects to water sources associated with groundwater withdrawal are described in Section 3.3.2.8 in the Final EIS. The limitation and uncertainty regarding the numerical groundwater flow model used in the analyses also are outlined in this section. The regional scale represented by the numerical flow model encompasses an area of over 20,000 square miles and approximately 35 hydrographic basins. Sources of uncertainty inherent in the regional model include incomplete or limited information for this broad region and generalizations and simplifications required to construct the model. Because of these limitations, the regional model is not a reasonable or appropriate tool to quantify changes in groundwater elevation of less than 10 feet or predict small changes (i.e., less than 5 percent) in flow at specific springs or streams (as discussed below).

Standard Resource Responses

Common ID		Standard Response
WR-1 (Continued)		**10-foot Drawdown Criteria** The use of the 10-foot drawdown contour in the analysis also is explained in "Defining the Drawdown Area" in Section 3.3.2.8. The EIS analyses use the model simulations to identify water resources and water-dependent resources potentially affected by drawdown-related impacts within the drawdown area (defined by the 10-foot drawdown contour). These impacts are identified after an extended period of continuous pumping (i.e., up to full build out plus 200 years) before implementation of mitigation or adaptive management measures. For purposes of the programmatic evaluation in the EIS, a 10-foot drawdown contour is sufficient for a comparison of impacts among alternatives. The BLM chose the 10-foot contour as the area in which effects of drawdowns could reasonably be quantified given the regional scale of the model and uncertainties in simulating drawdown effects. Though quantification of impacts was limited to the area within the 10-foot drawdown contour, for certain water-dependent resources (e.g., regional springs, wildlife), additional qualitative analysis of impacts extends beyond that area. The EIS acknowledges that less than 10-feet of drawdown could reduce flows in perennial springs or streams controlled by discharge from the regional groundwater flow system. The use of the model-simulated 10-foot drawdown contour to define areas where impacts to perennial water resources are likely to occur is reasonable for the purposes of the regional programmatic-level evaluation considering the model limitations previously described. **5 Percent Flow Reduction Criteria** The use of model-simulated flow reductions to identify potential "measurable" effects to springs and streams is described in "Evaluation of Model-simulated Stream Flow Results" in Section 3.3.2.8 of the Final EIS. The regional model is not considered an appropriate tool to predict small (less than 5 percent) site-specific flow changes for the reasons stated above. A less than 5 percent reduction of flow also would be difficult to accurately measure or distinguish from natural fluctuations and is presumed to be within the model uncertainty. For these reasons, and for the purposes of the programmatic level analysis, a flow reduction of 5 percent or greater is used to identify model-simulated springs and streams with the potential to experience flow reductions. **Model Refinement** The BLM recognizes that refinements, such as the collection of additional site-specific hydrologic information and model modifications such as the development of embedded models in specific areas of interest, would be necessary to improve the ability to predict drawdown impacts at a more localized scale. However, details regarding the number, locations, and pumping rates for wells are not yet available, and are not necessary for the purpose of this programmatic analysis. Additional site-specific data would be obtained and more detailed or local scale numerical groundwater flow models would be developed during subsequent NEPA analysis.
WR-2	Timeframes used for the programmatic analysis	The groundwater model was used to simulate potential long-term drawdown effects in the region. The time frames used for the analysis of groundwater pumping effects are described in Section 3.0.4 and 3.3.2.8 of the EIS. For the purposes of evaluating potential effects to water resources, the EIS analysis used numerical groundwater flow model simulations that extended to an estimated future point in time when the groundwater production would reach the maximum production rate and then allowed to pump continuously (at the maximum pumping rate) for an additional 200 years. In the EIS, this time frame is referred to as the "full build out plus 200 year time frame." For example, in the case of the Proposed Action, it was estimated that the project would reach full build out in the year 2050 and the model simulations continued for an additional 200 years (e.g., model year 2250). The model simulations at full build out plus 200 years were used to evaluate the potential long-term risk to water dependant resources as described in Section 3.3.2.8.

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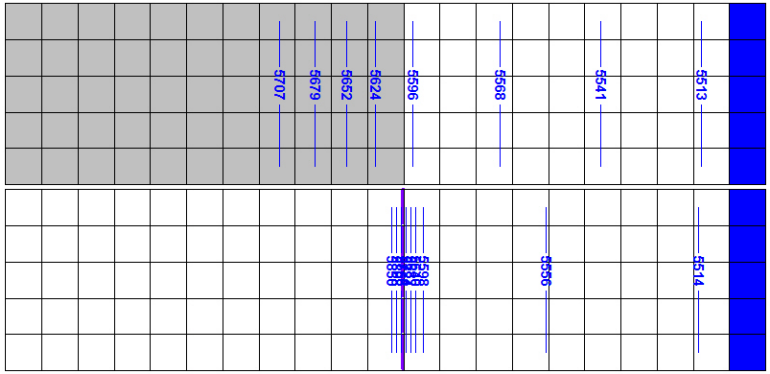
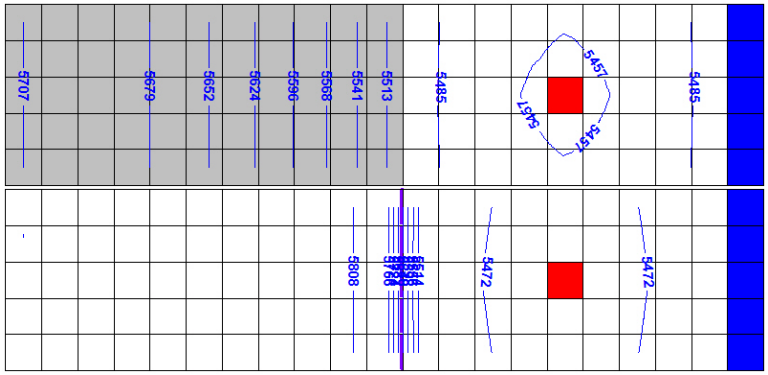
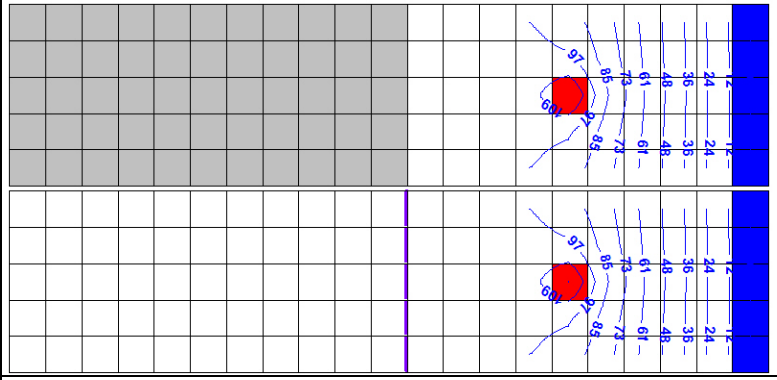
Common ID		Standard Response
WR-2 (Continued)		The BLM does not believe that it is reasonable to use the model to attempt to simulate potential drawdown at points in time that are further out in the future than the full build out plus 200 years timeframe used in the EIS. Draft EIS review comments have requested that the model simulations be extended further into the future including the point at which the model simulations reach steady state (i.e., equilibrium) conditions. Reaching steady state will take a long time; perhaps 1000s of years (for example see Bredehoeft and Durbin, 2009). Attempting to make predictions 1000s of years into the future is not reasonable or realistic considering uncertain climate conditions and possible changes in groundwater pumping rates. A steady state simulation would need to assume specific climatic and groundwater withdrawal rates over thousands of years in the future but these conditions likely will change with time. For these reasons, model simulations over longer time frames than those provided in the EIS would not realistically reflect future conditions; and therefore would not be reasonable for use in the EIS analysis. The BLM determined that 200 years is a reasonable timeframe for simulating drawdown impacts given the level of uncertainties in attempting to simulate drawdown effects for greater time periods. In determining the temporal limit of the model, BLM considered available data for model calibration and BLM and USGS (Halford and Plume 2011) prior analysis in Nevada for other major groundwater withdrawal projects. Here, BLM extended application of the model runs out to the full build out plus 200 years timeframe to provide one indicator (with its recognized inherent uncertainties) of long-term impacts for a comparison of impacts among alternatives.
WR-3	Representation of faults in the groundwater flow model including use of horizontal flow barriers	Major faults and fault zones with large displacements occur throughout the region of study (for example, see **Figure 3.3.1-11** in the EIS). Fault zones may behave as barriers, conduits, or combined conduit/barrier systems that enhance or restrict groundwater flow (Caine et al. 1996) as summarized in Section 3.3.1.5 under the heading “Hydrostructural Conditions.” As described in Section 5.3.1.2 of the Transient Numerical Groundwater Model (SNWA 2009b), selected regional faults were added to the model where necessary to improve calibration. The inclusion of hydrologic fault barriers was used to simulate and represent the observed field data. The presence of these regional faults was supported by geologic mapping data (SNWA 2008); and only those faults that were thought to influence the observed hydraulic gradient were incorporated into the model. The representation of faults in the model and the uncertainties associated with these structural features is discussed in Section 3.3.2.8 under the heading “Methodology, Assumptions, and Limitations” of the EIS, and within the model report (SNWA 2009b). Representing faults as barriers to flow also is supported by recent research in Nevada. Monitoring associated with dewatering activities related to open pit and underground mining activities in the Carlin Trend in north central Nevada have demonstrated that major basin and range type faults zones can restrict the propagation or spread of drawdown resulting from the groundwater pumping as described in Section 3.3.1.5 of the FEIS and in Zhan et at. 2011. The model used for the EIS has been presented as a calibrated model; however, the EIS acknowledges that groundwater model solutions are not unique and that other combinations of parameter values and boundary conditions may provide an equally justified calibrated model that also approximates the groundwater flow system (Section 3.3.2.8). As described in the numerical model report (SNWA 2009b) properties of the faults were adjusted during the calibration process. The EIS acknowledges in Section 3.0.3, Incomplete and Unavailable Information, that site-specific information on the properties of these faults is not available. Furthermore, obtaining this type of information over the broad region would be cost prohibitive and require excessive amounts of time. It is important to note that low bedrock conductivity in a MODFLOW model, like the one used in this case, could produce the same functional response as including a hydrologic flow barrier (HFB), albeit with a less abrupt head drop at the boundary of the low and high conductivity material.

Standard Resource Responses

Common ID		Standard Response
WR-3 (Continued)		Some commenter's have suggested that the model should be constructed without representing the faults as barriers to flow. If this were done, other compensating parameters would be modified in the model so that the model would be calibrated to field conditions. A simple test case was constructed to evaluate the functional response to drawdown that would occur if a specific fault zone were removed and replaced with low permeability bedrock required to provide an equivalent calibration model. This is illustrated below with a simplistic model. The two mini-grids are 10,000 feet thick, 20,000 feet wide, and 80,000 feet long with a recharge of ~5.7x10-5 ft/day (0.25 inch/year) on the left side. Both transmit 50,000 cubic feet of water per day prior to pumping. The first model has a conductivity of 0.026 ft/day in the grey zone and 0.1 ft/day on the right. The second model has a regional conductivity of 0.1 ft/day with a fault zone represented by an HFB with a conductance of ~8x10-7 per day (1/d). The HFB conductance is equivalent to a fault with a width of 1000 feet and a conductivity of ~8x10-4 ft/day. Both models provide a similar restriction to flow and drawdown propagation when a well is pumped at the location of the red square in the figure below. This demonstrates that two different conceptual models (one with low permeability bedrock in the mountain blocks and no representation of faults and the other with HFBs representing faults) could produce essentially the same functional response. Head in feet prior to pumping:  Head in feet after pumping until steady state is reached 

Standard Resource Responses

Common ID		Standard Response
WR-3 (Continued)		Drawdown in feet after pumping until steady state is reached 
WR-4	Proposed mitigation for Shoshone Ponds	Proposed mitigation for potential impacts to the source of flow that sustains Shoshone Ponds is described in GW-WR-5 in Section 3.3.2.9 of the Final EIS. This measure is provided as a possible mitigation and is provided in accordance with CEQ guidance that states "relevant, reasonable mitigation measures that could improve the project are to be identified" (CEQ Forty Most Asked Questions Concerning CEQ's NEPA Regulation, March 23, 1981, Question 19b). More specific measures may be identified during subsequent NEPA review. Under this proposed mitigation measure, SNWA would be responsible for all cost associated with the implementation, operation and maintenance of the source of water required to offset the effects of SNWA's groundwater pumping activities.
WR-5	Potential impacts to Fish Springs	The baseline spring discharge and potential effects to spring discharge resulting from the GWD project are addressed in the EIS. Published information regarding spring discharge at Fish Springs is provided in Section 3.3.1.4 under the minor heading Great Salt Lake Desert Regional Flow System. The potential effects to spring discharge at Fish Springs were evaluated as described in Section 3.3.2 and 3.3.3 of the EIS for each alternative under the heading Impacts to Water Balance. The potential effects to aquatic biological resources within the Fish Springs area are discussed in Section 3.7.
WR-6	Groundwater flow model area	The methodology used to develop and construct the regional groundwater flow model used for the EIS analysis (i.e., CCRP model) is summarized in Section 3.3.2.8 in the Final EIS. Section 3.3.2.8 incorporates by references detailed technical reports that document the model construction. As described in Section 3.3.2.8, the model encompasses all or portions of 35 hydrographic basins and over 20,000 square miles. The northeast boundary of the model was selected to correlate with the boundary of the USGS Basin and Range Carbonate-rock Aquifer System (BARCAS) study area (Welch et al. 2007). The BARCAS study was mandated by federal legislation—the Lincoln County Conservation Recreation and Development Act (LCCRDA)—to develop additional information regarding water availability and hydrogeologic conditions relevant to potential groundwater development associated with the proposed GWD project. In addition, it documented baseline information regarding spring locations, irrigated acreage, and interpretive studies of recharge, evapotranspiration, and hydrogeology and groundwater flow. The information developed for the BARCAS study was evaluated and used, where appropriate, in the construction of the CCRP model (SNWA 2009a,b).

Standard Resource Responses

Common ID		Standard Response
WR-6 (Continued)		Hydrographic basins for the CCRP model were selected to include all or portions of regional groundwater systems potentially affected by the groundwater development project while also incorporating information from the BARCAS study in the northern portion of the study area. Because the northeast boundary of the CCRP model domain was designed to correlate with the east boundary of the BARCAS study area, the CCRP model does not encompass hydrologic basins in Utah located east of Snake and Hamlin Valley that are believed to contribute flow to the Great Salt Lake Desert Regional Groundwater Flow System; specifically, Pine, Wah Wah, and Tule valleys and most of the Fish Springs Flat hydrographic basin. As described in Section 3.3.2 and 3.3.3 in the Final EIS, the drawdown area for some alternatives and cumulative pumping scenarios intersects this northeast boundary along the boundary between Hamlin and Snake Valley (within the model) and Pine Valley (located east of the model). Even though Pine Valley is located outside the model domain (and outside the BARCAS study area), the potential effects to water resources in Pine Valley were evaluated by estimating the susceptibility of surface water resources within the basin to effects associated with potential drawdown from the GWD project as described in the EIS. For example, see the description under the heading "Utah Surface Water Resources" in Section 3.3.2.9 for the Proposed Action; and "Hydrologic Baseline Data Summary – Pine Valley" provided in Appendix 3.3.17 of the Final EIS. The results of this evaluation indicate that springs and other surface water features in Pine Valley likely are controlled by local (or perched) groundwater that is not interconnected with the regional groundwater flow systems; and therefore, impacts to surface water resources in Pine Valley are not anticipated. The drawdown area as defined and presented in the Final EIS does not propagate to the boundary of Wah Wah or Tule Valleys or Fish Spring Flats within the full build out plus 200 year timeframe considered in the impact assessment. Therefore, the type of impact evaluation provided for Pine Valley was deemed unnecessary for Wah Wah and Tule valleys, and Fish Spring Flats. Subsequent to the development of both the CCRP model and the BARCAS study, the USGS developed an updated potentiometric map for Snake Valley and adjacent areas. This map indicates that 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 Tule valleys. This report also indicates that north of this barrier, there is uncertainty regarding the existence of substantial inter-basin flow between Snake Valley and Tule Valley (and subsequently, Fish Springs Flats). 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.
WR-7	Impacts to Water Quality	The baseline water quality in the region is summarized in Section 3.3.1.6 with additional details provided in Appendix F3.3.4; and in the baseline characterization report (SNWA 2008) and other reports incorporated by reference. Potential impacts to water quality are discussed in Section 3.3.3.9. The water quality is generally good within areas affected by proposed groundwater development; the proposed groundwater pumping is not expected to result in substantial changes to groundwater quality. Impacts to groundwater quality will be further evaluated during subsequent tiered site-specific NEPA review.

Standard Resource Responses

Common ID		Standard Response
WR-8	Request to add more detailed descriptions and comparisons of the potential impacts to water resources	The additional details requested to be added to the written description of potential effects were tabulated in the summary tables provided in Appendix F3.3 in the Draft EIS (and in the Final EIS). These tables were incorporated by reference into the EIS and were provided in the EIS appendices in accordance with CEQ NEPA Regulation 1502.21 (Incorporation by Reference) and 1500.4 (Reducing Paperwork). In specific locations in the document, the descriptions of the potential effects, monitoring and mitigation measures, and residual effects refers the reader back to earlier discussions provided in the section rather than repeating essentially the same text for each alternative description. This reference back to earlier discussion was done to reduce redundant descriptions in accordance with CEQ NEPA Regulation 1502.21(Incorporation by Reference) and 1500.4 (Reducing Paperwork).
WR-9	Federal Reserve Water Rights	Federal Reserved Water Rights are discussed in Section 3.3.1.7 of the EIS. Federal reserved water rights do not convey any additional protections under state water law. Neither Nevada nor Utah recognize Federally Reserved water rights in their states until the basin has been adjudicated pursuant to the state's water rights laws. This EIS recognizes the existing active water rights identified by each state within the region of study; and has described the potential impacts from this project to these water rights. Adjudication and protection of federal reserved water rights that may be identified and recognized by the states in the future is outside the scope of the EIS process. Impacts to all potential water sources – whether or not those sources are the subject of federal reserved water rights, state appropriation-based water rights, or are unappropriated waters – have been summarized, evaluated, and considered in the EIS in Sections 3.3.2 and 3.3.3 with additional details provided in Appendix F3.3. Similarly, project mitigation measures apply to all water sources regardless of water rights status. By analyzing potential impacts to all identified water sources, the EIS analysis thus encompasses potential impacts to any federal reserved water rights that may later be identified in or adjudicated on these sources.
WR-10	Groundwater flow model development	There are many ways the groundwater flow system could be represented by a numerical model. If 100 groundwater modelers worked with the available data, 100 different models would result. The general regional scale behavior of the system would be similar, but the details of the model construction at individual locations would differ substantially. Consequently, there is no one "correct" representation. In fact, seeking the one "correct" model would render the task impossible leaving society to make decisions without a numerical model. For a regional groundwater flow system this large and complex, all of the models would have inaccurate representations at some locations. However, when used for regional scale assessments and comparison of alternatives, all of the models assuming appropriate inputs and model calibration likely would be sufficient. For the CCRP model used in this case, if the details of a particular barrier or layering representation are significant in a specific basin, the details of these features could be explored in the small scale models that will be used during subsequent tiered site-specific NEPA review.
WR-11	Calibrated model provides best estimate. High diffusivity illustrates sensitivity.	The groundwater model was developed based on available data including storage and hydraulic conductivity properties. The model was then calibrated by adjusting values to improve the similarity of model results and measured groundwater data. The calibrated model produced the best estimate of extent and magnitude of drawdown, not the minimum extent and magnitude of drawdown as mentioned in some of the water resource comments. A "high diffusivity" (or "bounding") groundwater modeling simulation was conducted for Alternative A. The high-diffusivity run was conducted as a sensitivity analysis to evaluate how hypothetically low storage and high hydraulic conductivity values would affect the predicted drawdown patterns resulting from the GWD pumping. A valid sensitivity analysis requires a similar quality of calibration, thus the hydraulic conductivity and storage properties could not be changed substantially. The results of the model run are documented in Section 5.0 of the scenario simulation report (SNWA 2010b).

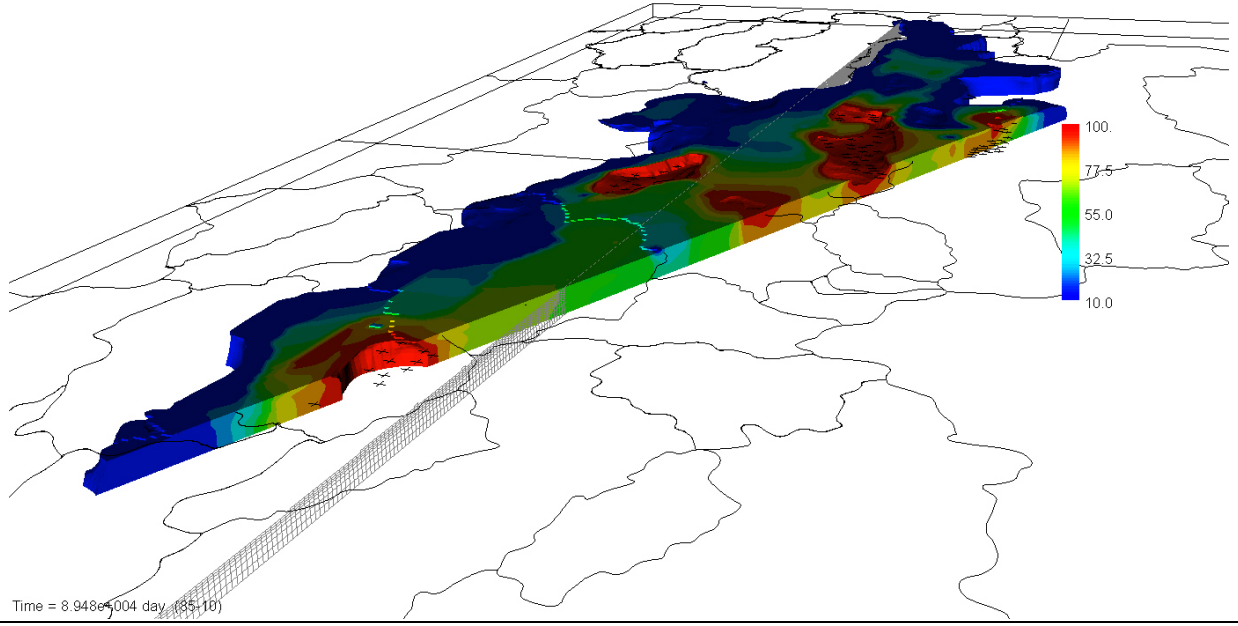
Standard Resource Responses

Common ID		Standard Response
WR-11 (Continued)		BLM concluded that it should not rely on the high-diffusivity simulation to predict the magnitude of drawdown in the EIS analysis because use of the high-diffusivity properties in the calibration run decreased the similarity of model results and field measurements (i.e., model fit) as shown in Table 5-2 (SNWA 2010b). Accordingly, BLM concluded that the calibrated groundwater model provided a sufficient representation of the flow system for estimating effects to water resources for the programmatic level of analysis; and recognizing that more detailed groundwater flow modeling would be conducted in subsequent tiers of the analysis. Nevertheless, the high-diffusivity simulation provides insight into the uncertainties associated with the groundwater modeling simulations.
WR-12	Depth decay of hydraulic conductivity	"Rates of depth decay of hydraulic conductivity" refers to the reduction in the value of hydrologic conductivity with increasing depth below the surface A comprehensive evaluation of field data to determine depth decay of hydraulic conductivity is presented in section 4.6.2 "Hydraulic Properties of RMUs" of the Conceptual Model report (SNWA 2009a) and references C.1.3.6.4 "Analysis of Hydraulic Conductivity versus Depth." This analysis was based on available data from multiple sources over very broad regions and in various rock formations. Because data were scarce, correlations could not be perfected. Given the uncertainty associated with the relationship, BLM determined to only apply a depth-decay relationship to the UVF RMU and carbonate fault zones within the CCRP model using MODFLOWs KDEP functionality. The UVF RMU had the highest correlation and is comprised of unconsolidated sands and gravels, which would be expected to naturally compress at depth given the overlying load. The fault zones were assumed to be composed of fractured material, similar to the UVF material, which would be expected to naturally fuse with depth. This has been described in section 4.2.4 "KDEP Parameters - HUF2 Package" of the numerical model report (SNWA 2009b).
WR-13	Reasonable parameters	The model is a regional representation of the hydrostratigraphic and hydrostructural conditions throughout the 20,000-square-mile model domain. Although there are uncertainties and limitations, the CCRP model is a reasonable tool for estimating probable regional-scale drawdown patterns and trends over time resulting from the various pumping scenarios evaluated in the EIS.
WR-14	Use of estimates of subsurface flow	As in most models of groundwater systems, the flow rates and hydraulic conductivities are dependent on one another. Measurement of flows and/or hydraulic conductivities in the field facilitates understanding of their absolute (versus relative) values. It is not possible to measure subsurface flow at basin boundaries, so estimates of subsurface flow from multiple sources have been used as surrogates to field measurement of flows. These estimates constrain the effective values of hydraulic conductivity of the layered units and the flow barriers using methodology described in the Conceptual Model Report (SNWA 2009a).
WR-15	Sparcity of calibration data	There are many calibration data for this model as compared to most practical groundwater model applications. As is typical for every groundwater model, the data have numerous limitations. For example it would be desirable to have longer periods of record for spring flows, but they are not currently available. It would be desirable to have more data closer to areas of pumping, but they are not currently available. New data that become available could be incorporated into future groundwater modeling for tiered site-specific NEPA review.

Standard Resource Responses

Common ID		Standard Response
WR-16	Over parameterization	In general, "parameters" refer to the values used to represent the characteristics of a groundwater system. Examples of model parameters include hydraulic conductivity, specific yield, specific storage, and recharge. The model considered here predicts impacts over an area of much diversity covering approximately 20,000 square miles, so it is expected that the characteristics will vary substantially and that many different values of those characteristics will be used to simulate the system. The modeling began by defining the spatial distribution of geologic units and assigning property values based on field measurements of properties in those units, or similar units when measurements were not directly available. When using a parameter estimation technique to calibrate a model, "parameters" refers to the number of values adjusted in the process of optimizing the model to match the field measurements. Many values of hydraulic conductivity may be used to represent different geologic units, but only a few parameters may be adjusted to calibrate the model. For example, four parameters might be used, a multiplier for the high hydraulic conductivity units and another for the low conductivity units along with a couple of multipliers for high and low recharge areas. Over parameterization occurs when too many parameters are adjusted to obtain a good fit to the observed heads and flows such that the pattern of parameter values is unreasonable. As explained below, that is not the case for this model. Sections 5 and 6 of the numerical model report (SNWA 2009b) identify all parameters and explain that calibration of the CCRP model was primarily accomplished by trial-and-error with insight gained from monitoring the dimensionless sensitivities, the composite scaled sensitivities, the sum-of-squared-weighted-residuals, and the distribution of weighted residuals as calculated by parameter estimation software (UCODE). The parameters that are the most sensitive include the constant head boundaries (CHD) and hydraulic conductivities. While the constant head condition boundaries are some of the most sensitive parameters in the model they are also at the outer edges of the model and distant from most of the effects of simulated pumping. Some of these boundaries such as the one in Northern Snake Valley have good information to define the boundary. A literature survey was performed to obtain a range of possible flows across model boundaries with a target then selected for model calibration. These values were then hand calibrated to match observations of heads and flows throughout the model domain while trying to match as closely as possible the targeted flows at the boundaries. Figures 6-15 and 6-16 in 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) show how well the simulated flows match the targets and the ranges for each boundary. Again, while there are uncertainties as to the constant head conditions at the model boundaries, the distance to the boundaries from pumping centers has a relatively minor influence on them. As can be seen from the model simulations, only a few of these boundaries are influenced by simulated pumping and relative change is minor. Therefore, these uncertainties do not unreasonably affect the simulated effects of project pumping. Hydraulic conductivities also were highly sensitive. However, the uncertainties associated with these sensitivities were reduced by performing a standard analysis of the available hydraulic property information for the Great Basin Region. As part of this analysis, available aquifer property information was collected, grouped into like hydrogeologic units, and statistically analyzed to determine the range of values as well as a mean value. This approach also was reviewed and approved by the BLM Hydrology Technical Review Team. The data compilation and statistical process for calibrating hydraulic parameters is described in Appendix C of the conceptual model report (SNWA 2009a). The level to which parameters were adjusted during calibration was determined by their level of certainty. For highly certain parameters, such as a constant head at a model boundary for which substantial well data were available over a long period of time, there was little need for adjustment. The calibration process for the CCRP model is explained in Section 5 of the numerical model report (SNWA 2009b). At the completion of model calibration the model is evaluated by reviewing the fit of simulated hydraulic heads and flows to observations of heads and flows in the field and evaluating whether the parameter values are reasonable. These activities help to ensure that the model is a good approximation of the natural system given the many uncertainties and that the parameters were modified within realistic guidelines to achieve the final model fit. The model evaluation of the CCRP model is documented within Section 6 of the numerical model report (SNWA 2009b) revealing that it is a reasonable representation of the system.

Standard Resource Responses

Common ID		Standard Response
WR-17	Distribution of pumping by lithology	The groundwater pumping scenarios used for the model simulations included pumping primarily in upper and lower valley fill with some pumping in the carbonate units. As described in Section 1.3.6 of the Final EIS, details regarding the number and locations of wells and pumping rates are presently unknown. Groundwater exploration activities for the proposed GWD project have not been completed. The water use schedules and representation of groundwater withdrawal used for the pumping scenarios is discussed in Section 4.1.2.1 of the simulation of scenarios report (SNWA 2010b). The groundwater model simulates drawdowns propagating through all of the layers of the CCRP model except for areas close to the pumping wells. This can be seen in the following snapshot of drawdown at the end of the year 2249 for the cumulative impact analysis under the Proposed Action scenario. Red represents 100 feet of drawdown. Areas of greater drawdown are blank as can be seen in the drawdown cone in the southern portion of the model. In locations with the same color throughout the vertical section, drawdown is the same in all layers. 
WR-18	Representation of springs	The simulated discharges to regional springs compare well with observed data, as indicated in Figures 6-33 and 6-34 of the numerical report (SNWA 2009b). The quality of calibration for intermediate springs varies depending on the ability of the regional model to represent the features that produce the intermediate springs. Additional springs were included in the model for reference but were not used as calibration targets because they were intermediate and local springs that would not be well represented by a regional model. The simulated impacts to those springs are less certain due to the regional nature of the model. Because impacts to flow at local springs could not be quantified through simulation in the regional groundwater model, BLM qualitatively evaluated the risks to local springs based on their interconnection with the regional groundwater system and simulated drawdown in units that are the likely spring sources as described in the EIS Section 3.3.2.8 under the heading Identification of Springs and Streams Susceptible to Drawdown Impacts.

Standard Resource Responses

Common ID		Standard Response
WR-18 (Continued)		Ongoing and future field data collected for springs located in Spring, Dry Lake, Delamar, and Cave Valleys will provide additional data for use in calibration of future groundwater models to be used in subsequent tiered NEPA. In particular, the hydrologic monitoring of baseline and project operation will provide data at representative spring locations. Descriptions of the hydrologic monitoring are provided in the monitoring plan for Spring Valley (SNWA 2011a) and the Cave, Delamar, and Dry Lake valleys (SNWA 2011b).
WR-19	Estimation and representation of recharge	The recharge estimates were based on standard analysis similar to that used by Maxey and Eakin (1949) to estimate recharge efficiencies for 13 basins in Nevada. For the CCRP model, recent data and information on precipitation, groundwater ET, and inter-basin flow were used to update the recharge efficiencies. The State of Nevada has relied upon the Maxey and Eakin (1949) recharge efficiencies to publish estimates of recharge for basins throughout Nevada (see Reconnaissance Report Series, Scott et al. 1971). In the case of the CCRP model, the same approach was used but with updated data, computer optimization, and technologically-advanced mapping of precipitation based on PRISM. The results yielded initial estimates of precipitation, recharge efficiencies, and recharge throughout the model domain which were used as model inputs during the construction of the model. The initial estimates were subsequently adjusted during model calibration. The spatial distribution of recharge is largely dependent upon the distribution of precipitation, thus more recharge occurs where there is greater precipitation. However, the recharge distribution was adjusted during model calibration based on other factors that affect the distribution of recharge; including the hydraulic characteristics of geologic units present near the surface, and the occurrence of perennial and ephemeral streams. As a result, the final recharge distribution accounts for the factors that affect its magnitude and distribution, and is a product of the model calibration. The timing and magnitude of groundwater capture is controlled by pumping rates and hydraulic diffusivity estimates. Predictive errors related to recharge rates are limited to uncertainty in recharge propagation and calibrated transmissivity. Transmissivities generally are overestimated if recharge volumes are overestimated. Leake (2011) summarizes it as follows: “Hydraulic diffusivity, or distributions of hydraulic conductivity, specific storage, specific yield, and system geometry, control the rates and locations of capture and these parameters must be considered in estimating capture, whether the approach is analytical, numerical superposition, or numerical-flow modeling. Furthermore, details of the flow system such as groundwater divides, and rates and directions of groundwater flow do not affect timing and locations of capture in reasonably linear systems.” Uncertainties associated with the groundwater budget components that define the recharge volume and recharge distribution for each flow system can be reduced through additional data collection.
WR-20	Representation of storage	Although the storage parameters were adjusted during calibration to fit calculated estimates based on field data, the calibrated values of specific storage fall within the range cited by Anderson and Woessner (1992, Table 3.4). Figures 6-52 and 6-53 of the numerical model report (SNWA 2009b) show that storage values used fall within the literature ranges.

Standard Resource Responses

Common ID		Standard Response
WR-21	Structures in the vicinity of Hiko, Crystal, Brownie, and Ash Springs	Baseline geologic and hydrogeologic maps and cross-sections for the region of study were provided in the baseline report (SNWA 2008). This information identifies that the North and South Pahroc Range and Hiko Range, that comprise the upland area that separates Dry Lake Valley and Delamar Valley from the area where the spring discharge occurs in Pahranagat Valley, is composed of Tertiary Volcanic Rocks consisting largely of moderately to densely welded tuffs underlain at depth by Paleozoic carbonate rocks. There also are a series (up to nine separate) roughly parallel north-south oriented fault zones mapped between the western margin of Dry Lake and Delamar valleys and Pahranagat Valley where Hiko, Crystal, and Ash Springs emerge (for example, see cross-section S-S'; O-O', and N-N' on Plate 8, SNWA 2008). Gravity data for the region supports the presence of major basin-bounding fault structures on the west side of Dry Lake and Delamar Valleys (Rowley and Dixon 2011). The series of north-south oriented basin and range faults are inferred as likely barriers to groundwater flow (Rowley and Dixon 2011, p. 6-10). Hence, the conceptual model used to construct the numerical model with HFBs is consistent with the geologic information for the region. In addition, the hydraulic gradient in the carbonate rock and basin fill material in Dry Lake and Delamar Valleys is toward the south (Burns and Drici 2011, Plate 2). Isotopic data also supports the conclusion that little if any flow from Delamar Valley contributes to groundwater that discharges at the major regional springs in Pahranagat Valley (Thomas and Mihevc 2011). In summary, the geologic, potentiometric and isotopic data and analyses support that the groundwater model is a reasonable representation of the groundwater flow system between Dry Lake, Delamar, and Pahranagat valleys. Finally, the regional springs in Pahranagat Valley are located approximately 18 miles west of the closest proposed groundwater development area (Delamar Valley). SNWA has committed to groundwater monitoring between the pumping basins and Pahranagat Valley that would be used to monitor drawdown that propagates toward Pahranagat Valley and provide an early warning system if unanticipated effects emerge during the project operation (SNWA 2012c).
WR-22	Use of PRISM data	The PRISM precipitation data are widely considered the best available mapping of precipitation for the groundwater model area. These data are more accurate than other precipitation maps or other precipitation distributions derived using precipitation-altitude relationships. PRISM precipitation distributions were used in estimates of recharge and groundwater discharge in the BARCASS (Welch et al. 2007) and the most recent USGS study of the area (Heilweil and Brooks 2011). Use of PRISM data leads to a conservative recharge estimates. A comparison between the PRISM precipitation grid used in the development of the groundwater flow model and precipitation-station data is included in Section 6.0 of the conceptual model report (SNWA 2009a). This comparison indicates that the PRISM precipitation grid systematically overestimates precipitation throughout the model domain. Section 6.0 of the conceptual model report describes the effect of overestimated precipitation as applied in the analysis: "As precipitation is subtracted from ET to obtain groundwater ET, the larger estimates of precipitation derived from the PRISM grid will lead to smaller estimates of groundwater ET and, therefore, smaller recharge estimates. This demonstrates that the use of the PRISM precipitation distribution leads to conservative estimates of recharge and is appropriate in this study."
WR-23	External boundary fluxes	The external boundary fluxes were used in the application of the groundwater-balance approach to estimate initial recharge efficiencies for the flow systems comprising the flow model domain that are described in Harrill et al. (1988) and Harrill and Prudic (1998). These flow system boundaries generally are accepted in the scientific literature, including the most recent USGS study of the area by Heilweil and Brooks (2011). It is reasonable to apply the method to individual flow systems because the implicit assumption is that the fluxes across the flow system boundary are minor compared to the entire groundwater budget and the inter-basin flows within the boundary of the flow system. By applying the method to flow systems where the external boundary fluxes are relatively small, the large uncertainties associated with estimates of inter-basin flow are minimized.

Standard Resource Responses

Common ID		Standard Response
WR-24	Inter-basin flows	Estimates of inter-basin flow within the model domain are presented in Appendix H of the CCRP Conceptual Model report (SNWA 2009a), but were not used in the model calibration as observations or calibration targets. Inter-basin flows derived by the CCRP model are part of the solution of the calibrated model, and are dependent upon the other input data and observations used in the calibration (for example, recharge distribution, groundwater discharge, hydraulic head observations, spring flows, and external boundary fluxes). Information from BARCASS was not used to further constrain calibration of the groundwater flow model because doing so would overly constrain the model by forcing the calibration to conform to those uncertain estimates of inter-basin flow. The uncertainty of these estimates is illuminated by the most recent USGS studies in which discharge exceeds recharge in Steptoe Valley; thereby, requiring inter-basin inflow to the valley rather than inter-basin outflow (Heilweil and Brooks 2011). It is because of this high uncertainty that inter-basin flow estimates within the model domain were not used as calibration targets; rather, observations and estimated parameters were used to calibrate the model and provide a solution defining flow directions and magnitudes within the model domain. Only external boundary fluxes were estimated and used as calibration targets. Rather than rely upon the assorted literature estimates, these estimates of external boundary flows were derived independently using Monte Carlo simulations and Darcy's Law with estimated values of transmissivity, hydraulic gradient, and flow-section width (SNWA 2009a). The best available data and information were used in the derivation of these estimates, including evaluations of the hydrogeologic conditions at the external boundaries of the model, compilation and analysis of aquifer-property data, and compilation of available groundwater data to estimate hydraulic gradients across the boundaries.
WR-25	Use of confined option in MODFLOW	Commenter's have questioned the use of the confined option in construction of the CCRP model. Use of the confined model option is a common approach for large geologically complex regions such as the Great Basin. This technique also was employed in the United States Geological Survey's groundwater model for the Death Valley Regional Flow System of Nevada and California (Belcher and Sweetkind 2010). The authors of the MODFLOW computer application, the platform for the CCRP model, have designed many packages that assist in dealing with any limitations that may arise from this configuration and those packages were used in the development of the CCRP model. The effect of using confined versus unconfined layers has been analyzed by Faunt et al. (2010) for the Death Valley Regional Flow System Model and by Wylie (2004) for the Eastern Snake Plain Aquifer Model. Both studies report that using the same techniques as were used in the CCRP model provided high quality results. Using the MODFLOW misnomer of confined (which means transmissivity is not a function of head) actually leads to over prediction of drawdown because pumping rates can be sustained given that the transmissivity does not decrease at the well. As such, pumping can continue and large drawdowns can be calculated. This situation would present a problem if the model were to be used for well field design, but use of the confined layer approach is reasonable for the purpose of assessing regional-scale impacts with focus on comparing the relative impacts of alternative pumping scenarios.
Vegetation		
Veg-1	Vegetation Reestablishment: Loss of wetland meadow/basin shrubland vegetation would not be replaced by upland plant communities	Thank you for your comment. Additional analyses would be performed during subsequent NEPA to address specific areas with specialized plant communities and specific soil conditions.
Veg-2	Loss of Winterfat	Winterfat (white sage) is an important vegetation community in the region given its biological and resource values. The proposed pipeline routes, as submitted by the applicant, have been analyzed in this EIS and the impacts associated with the proposed alignment have been presented. Potential long-term impacts to vegetation related to groundwater drawdown are addressed at a programmatic level in this EIS. Additional site-specific analysis of impacts to winterfat would be addressed in subsequent NEPA and BLM management decisions in response to the results of ongoing monitoring.

Standard Resource Responses

Common ID		Standard Response
Veg-3	Annual invasive weeds cannot be successfully treated/prevented in areas of disturbance	Thank you for your comment. An alteration of the natural fire regime could result from the presence of annual weed species resulting in further reductions to AUMs in the affected grazing allotments. ACMs, BMPs, and mitigation measures provided in Section 3.5 (Vegetation Resources) are designed to reduce the spread and establishment of invasive species. Measures to promote reestablishment of desired vegetation communities and control noxious weeds include monitoring of vegetation communities and consultation with the BLM regarding seed mixtures and timing of planting. Additionally, compliance with BLM Handbooks H-9011, H-9011-1, H-9014, and H-9015, coupled with two to three years of pre-treatment for noxious weeds within the ROW, pre-use inspection of borrow and fill materials, and construction vehicle wash stations located within the ROW would promote vegetation reestablishment and minimize the establishment of noxious weeds.
Veg-4	Comparison and use of data sources to characterize vegetation community types	The Final EIS utilized multiple data sources to classify impacts to vegetation including Southwest Regional Gap Analysis Program (SWReGAP). Both SWReGAP and LANDFIRE are provided at the same resolution (30x30 meter) and so neither dataset provides a particular advantage over the other for the purposes of this EIS analysis. The Vegetation Resources Affected Environment section uses SWReGAP to characterize the types of communities that exist within the ROW and groundwater development areas. Please note that Table 3.5-7 also explains the ET types in the Region of Study later used to describe potential groundwater pumping impacts, Section 3.5.2.8. The Vegetation Environmental Consequences section uses SWReGAP for the ROW impact analysis. Note that surveys of the ROW were conducted and only one perennial stream is crossed (Section 3.3) and no wetlands are crossed (Appendix E). The methodology for the programmatic assessment of potential impacts to vegetation from groundwater pumping is explained in Section 3.5.2.8. Pumping impacts use ET vegetation types from a model developed by USGS which classified vegetation into evapo-transpiration Units (ET Units). This model used multiple data sets including: 1) slope analysis, 2) previous regional analysis, 3) National Land Cover Data (NLCD) and SWReGAP, 4) Aerial photography (USGS Digital Orthophoto Quarter Quads and Clark County Aerials), 5) Satellite Imagery (Landsat 7), and 6) GPS data. The output classified vegetation ET units were then simplified into five types for the EIS: 1) Open Water, 2) Bare Soil/Low Vegetation, 3) Phreatophyte/Medium Vegetation, 4) Meadow/Wetland and 5) Agriculture (see table 3.5-7). These data are at an appropriate scale to allow for the type of programmatic impact analysis conducted in the Final EIS. In addition to these ET vegetation data, the USGS National Hydrography Dataset (NHD) was used to classify springs and streams impacts. Local knowledge was collected to further classify springs and streams as perennial, intermittent or ephemeral. These are the groundwater dependent types (Wetland/Meadow, Basin Shrubland, Springs and Perennial Stream Reaches) that are quantified in each of the alternative's summary tables (e.g. Table 3.5-14) in the vegetation groundwater pumping sections as well as in the terrestrial wildlife groundwater pumping sections and appendix tables (e.g. Appendix F, Table F3.6-9).
Veg-5	Soil cover and its role in calculating emissions for use in air quality modeling	The percentage of soil cover is a critical factor in controlling both wind and water erosion. Soil cover is measured by including the canopy of live vegetation, plant residue, rock fragments, and soil crusts. While plant species are anticipated to change in some affected communities, total plant cover is not expected to decrease as a result of groundwater drawdown. Biological and physical soil crusts, where they currently exist, would not be affected by drawdown. As such, no net increase in soil erosion due to wind or water is projected in drawdown areas undisturbed by construction activities. However, when evaluating potential air quality impacts, a 10 percent decrease in the current plant cover is used to calculate windblown dust from wind erosion of exposed soil surfaces. This approach provides an upper bound on the estimated windblown dust that may be generated as a result of drawdown.

Standard Resource Responses

Common ID		Standard Response
Veg-5 (Continued)		Plants obtain the moisture necessary for growth and survival from precipitation, groundwater, or a combination of the two. Groundwater drawdown affects only those species that are dependent on groundwater as a primary source of moisture (e.g., obligate phreatophytic shrubs, spring-fed wetland species), while those plants that depend predominantly on free water at the surface from precipitation (grasses, forbs, and other upland/xeric species) would not be adversely impacted. Under drawdown conditions, it is likely that some springs would cease to flow, and groundwater elevations would eventually drop to levels unavailable to phreatophytes. This altered moisture regime would cause a definite and well-documented shift in species composition for groundwater-dependent communities, but is not likely to cause desertification. More likely, obligate phreatophytic vegetation (e.g., riparian- or wetland-associated vegetation) would be replaced either by more xeric species, or species that are able to thrive under the variable precipitation patterns characteristic of the arid southwest. Some facultative phreatophytic communities may exhibit little compositional or structural change due to drawdown (see discussion below). While a qualitative change (species composition) is expected, a quantitative change (percent cover) would not necessarily follow, as the means of propagating the more xeric species likely exist within or adjacent to potentially affected communities. As phreatophytes and wetland species are reduced in number and extent, new niches become available to other plant species that can exploit the drier site conditions. Such species may include xeric shrubs and grasses, halophytes, and succulents. As these upland/xeric species invade sites with altered hydrologic regimes, they likely would increase in density leading to similar (if not greater) amounts of live vegetation cover. While multiple factors ultimately influence the amount of cover on a given site (inter- and intra-specific competition, allelopathy, soil seed bank/distance to seed source, soil salinity, soil water holding capacity, nutrient availability, etc.), a change in moisture regime due to drawdown would not be expected to curtail succession. While groundwater drawdown is detrimental to obligate phreatophytes, but the potential responses of non-riparian (facultative) phreatophytes to changing water table depth are poorly understood. Initial site conditions may influence how a water table decline affects site vegetation (Cooper et al. 2006). In the Owens Valley, California, Sorenson et al. (1989) found that the growth and leaf area of greasewood (Sarcobatus vermiculatus) and rabbitbrush (Ericameria nauseosa) is controlled by soil water recharged by precipitation as well as capillary water rising from the water table. As such, these facultative phreatophytes may be more adaptable to water table declines than obligate phreatophytic shrubs. These researchers also found that a declining water table led to reduced plant cover at some sites, but not for all species (Sorenson et al. 1989). The response of some - but not all species - may occur because phreatophytes, such as greasewood, may primarily use precipitation-recharged soil water in certain seasons (Chimner and Cooper 2004), while other species in these communities may be able to grow without groundwater entirely. Greasewood may not only utilize water at the surface seasonally or opportunistically, but may also respond to a declining water table by growing deeper roots (Sorensen et al. 1991). In a 13-year study that examined plant community responses to water management activities (including drawdown) in the Owens Valley, Elmore et al. (2003) found that only 19 percent of the study area exhibited a linear decline in percent-live-cover. Fifty-one percent of the study area, including phreatophytic and xeric communities, showed no significant change in vegetation cover; and 30 percent showed live cover changes that increased over the study period. Increases were described as a function of variable precipitation (Elmore et al. 2003). Thus, drawdown does not necessarily lead to a decrease in vegetative cover; in some situations, cover may actually increase. Drought tolerant plant assemblages may survive decades under conditions of a declining water table with only reduced leaf area (Cooper et al. 2003), while other specific plants may experience a significant canopy dieback or death. Some phreatophytic plant species could grow roots to access deeper water tables (Sorenson et al 1991), but in cases of significant hydrologic changes, the entire plant community can change from phreatophytes to plants with no dependency on the water table (Merritt and Cooper 2000). Total live cover of vegetation would vary with species present and their density. While drawdown may ultimately eliminate groundwater dependent vegetation, other species are likely to invade the open niche and compete for available resources.

Standard Resource Responses

Common ID		Standard Response
Veg-5 (Continued)		Thus, there is sufficient evidence in the literature indicating that no significant reduction in total live vegetation cover should be expected in drawdown areas not directly impacted by construction. As such, no net increase in soil erosion due to wind or water is projected in vegetation communities altered by the effects of groundwater drawdown. Although no net increase in soil erosion is anticipated, there is inherent uncertainty and spatial variability in plant communities' response to drawdown, as discussed above. Therefore, to provide an upper bound on the uncertainty associated with the effects of soil erosion and plant cover on air quality, a 10 percent decrease of the current plant cover is assumed to result from drawdown. This assumption is a conservative estimate when compared with the findings of Elmore et al. (2003), and provides a conservatively high estimate of potential air quality impacts from groundwater drawdown. References Chimner, R., and D. J. Cooper. 2004. Using stable oxygen isotopes to quantify the water source used for transpiration by native shrubs in the San Luis Valley, Colorado USA. Plant and Soil 260: 225–236. Cooper, D.J., D. R. D'Amico, and M. L. Scott. 2003. Physiological and morphological response patterns of Populus deltoides to alluvial groundwater pumping. Environmental Management 31: 215–226. Cooper, D. J., J. S. Sanderson, D. I. Stannard, and D. P. Groeneveld. 2006. Effects of long-term water table drawdown on evapotranspiration and vegetation in an arid region phreatophyte community. Journal of Hydrology 325: 21-34. Elmore, A.J., J. F. Mustard, and S. J. Manning. 2003. Regional patterns of plant community response to changes in water: Owens Valley, California. Ecological Applications 13(2): 443-460. Merritt, D.M., Cooper, D.J., 2000. Riparian vegetation and channel change in response to river regulation: a comparative study of regulated and unregulated streams in the Green River Basin, USA. Regulated Rivers: Research and Management 16, 543–564. Sorenson, S. K., P. D. Dileanis, and F. A. Branson. 1989. Soil water and vegetation responses to precipitation and changes in depth to ground water in Owens Valley, California. US Geological Survey Open-file Report 89-260. Sorenson, S. K., P. D. Dileanis, and F. A. Branson. 1991. Soil Water and Vegetation Responses to Precipitation and Changes in Depth to Ground Water in Owens Valley, California. Prepared in cooperation with Inyo County and the Los Angeles Department of Water and Power. U.S. Geological Survey Water-Supply Paper 2370. Denver, CO.
Wildlife Resources		
WL-1	Avian Protection Plan and Bird Conservation Strategy	The Final EIS reflects the current status of discussions between the USFWS, SNWA, and BLM regarding a Bird Conservation Strategy and whether or not an Eagle Conservation Plan will be developed. The groundwater development project must be in compliance with the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, IM NV 2010-034, IM 2010-156, and IM NV 2010-063 before the Notice to Proceed can be issued. SNWA is required to continue consulting with the USFWS, and a Notice to Proceed would only be issued after BLM receives notification from the Service that the project is in conformance. As part of the consultation, adaptive management measures, mitigation measures, and applicant committed measures would be developed or refined. These measures should be documented in the Service's notification that conformance with the Acts has been reached, and will therefore be carried forward as requirements for the right-of-way in the Notice to Proceed.
WL-2	Greater sage-grouse	The Final EIS figures and analyses reflect the direction contained in BLM Instruction Memoranda: 2012-043 Greater Sage-Grouse Interim Management Policies and Procedures and 2012-044 BLM National Greater Sage-Grouse Land Use Planning Strategy. The Final EIS also considers the Nevada Energy and Infrastructure Development Standards to Conserve Greater Sage-Grouse Populations and Their Habitats.

Standard Resource Responses

Common ID		Standard Response
WL-3	ESA, FLPMA, BLM Manual 6840.2	The intent of the EIS process under NEPA is the disclosure of potential impacts related to a proposed project. The BLM makes land use decisions under FLPMA based on the results of that disclosure. Multiple use under FLPMA does not preclude irreversible or irretrievable impacts to protected species or other elements of the natural or human environment. The BLM is working with the USFWS to address impacts to federally listed species as directed by the Endangered Species Act.
WL-4	BLM Sensitive Species List and Nevada Wildlife Action Plan	The Final EIS analysis reflects the updated BLM Sensitive Species list and considers the Draft revised Nevada Wildlife Action Plan. The analysis presented in the Draft EIS used the previous versions of these two documents.
WL-5	Southwest Willow Flycatcher Revised Proposed Critical Habitat	The Final EIS analysis considers the USFWS Southwest Willow Flycatcher Revised Proposed Critical Habitat.
Recreation		
Rec-1	GBNP visibility concerns	Thank you for expressing your concerns related to impacts to visitation at GBNP and potential effects on regional tourism. Refer to Section 3.9.3 for a discussion of cumulative impacts for Recreation and Tourism.
Grazing		
GR-1		Your comment has been carefully considered by the BLM but has not resulted in changes to the analysis presented in the EIS. Change all responses that use GR-1 to the correlating standard response. Then change all GR-2 to GR-1.
GR-1	Vegetation Impacts related to grazing	Impacts to vegetation communities are analyzed by allotment for the project ROW, see Section 3.5.2. The groundwater pumping analysis was performed by correlating the 10 foot or greater drawdown contour to springs, streams, and phreatophytic vegetation communities. The BLM cannot accurately predict the impacts to future livestock stocking rates for individual allotments in this programmatic EIS due to uncertainties associated with the extended time horizons and other factors that may affect the availability of forage. Subsequent NEPA would perform a more detailed analysis of the effects of ground disturbance related to future facilities and the potential effects of groundwater drawdown on vegetation communities. Effects related to socioeconomics on a local scale also would be addressed in future NEPA.
Socioeconomics and Environmental Justice		
SocEcon-1	Project Costs	Thank you for expressing your interest regarding the estimated project costs. In response to this and similar comments regarding the project development cost and financing of the project, Section 2.6.8. SNWA's Estimated Project Development and Financing Cost has been added to the Final EIS. The section is based on information presented by SNWA at the Nevada State Engineer's hearing on the Spring, Delamar, Dry Lake, and Cave valleys. The estimates correspond to the Proposed Action. Corresponding estimates for the alternatives are also provided. Note that the BLM is not required by NEPA, FLPMA, or other regulations, to independently review or validate SNWA's projected costs, or to make a determination regarding the amount and equity of the potential costs to current and future ratepayers, system operating efficiency, or marketability of the proposed financing in the capital markets. Neither would BLM's granting a ROW for the main pipeline assure the project would be built. Ultimately, the SWNA's ability to finance, construct, and operate the project will be determined by the capital markets and regional economic conditions. Additional information regarding project costs, including testimony from parties not aligned with SNWA can be found at: http://water.nv.gov/hearings/past/springetal/.
SocEcon-2	Impacts of the recession on Las Vegas	Thank you for expressing your concern regarding the past, current, and potential future implications of the recent recession on economic conditions in the Las Vegas Valley, including the prospects for long-term population growth and growth in tourism, and the attendant implications for projected water demand as outlined in SNWA's water resource plan.

Standard Resource Responses

Common ID		Standard Response
SocEcon-2 (Continued)		The growth projections are reported in the description of the affected environment in Section 3.18 and Appendix F3.18 because they are part of the ongoing public dialogue regarding the future. The BLM understands that long-term population growth projections for Clark County, issued by the Nevada State Demographer, along with media reports about the economic slowdown, result in questions regarding the timing and need for the proposed groundwater development project. By including those projections in this EIS, the BLM is not validating, approving, or disputing the reasonableness of those projections, the underlying economic conditions associated therewith, or the "need" for the additional water as established by SNWA. Furthermore, an independent determination by the BLM regarding projected demand, the adequacy of current resources to serve more consumers through further conservation, or alternative sources of water is not within the agency's responsibility or authority when processing a ROW application submitted by a party satisfying the minimum conditions for applicants. SNWA satisfies those conditions. Text has been added to Section 2 of the Executive Summary and Sections 1.3 and 1.6 of the Final EIS to clarify that SNWA is solely responsible for projecting future demand and pursuing actions it deems reasonable and prudent to meet that demand and that the SNWA's plans to meet its projected demand are within the purview for BLM review in its processing of SNWA's ROW application.
SocEcon-3	Costs related to monitoring and mitigation	Thank you for expressing your concern regarding the costs associated with mitigation and monitoring. Information provided by SNWA, and included in its testimony at the Nevada State Engineer water rights hearings for Spring, Delamar, Dry Lake, and Cave valleys, indicates the estimated project costs include costs for implementation of the monitoring and mitigation requirements outlined in the Final EIS. It is the BLM's understanding that SNWA does not represent that the sum reflects the result of detailed calculations tied to specific impacts and mitigation measures, but rather that is an allowance for addressing potential impacts. Until SNWA completes detailed project designs, it cannot identify how the project would be financed and the effects of that financing on long-term operating costs and water rates are not known. Text addressing this topic is included in a new Section 2.6.8 SNWA's Estimated Project Development and Financing Cost in the Final EIS.
SocEcon-4		A number of comments expressed concern regarding potential adverse social and economic effects in Clark County if SNWA's proposed groundwater development project is not built. Section 3.18 acknowledges the concerns and that some economic disruption may result. However, LCCRDA precludes the complete denial of SNWA's right-of-way application, and thereby, could temporarily forestall major disruptions. As discussed in Section 3.18.2.9, under the subheading Relationship of the Groundwater Development Project to Potential Growth Inducing Effects, the availability of additional water does not assure future growth. Thus, the potential benefits implied by your comment, are uncertain. Furthermore, even if the application is not approved, SNWA could pursue other water source options to meet its long-term needs for existing and future consumers, including the option to submit applications for other ROWs. Thus, the potential benefits or adverse effects associated with approval or disapproval are uncertain.
SocEcon-5	Granting of water rights could foreclose future economic development	Section 3.18 and Appendix F3.18 acknowledge local concerns, primarily from White Pine County and residents and businesses in the Snake Valley, that SNWA's filing of applications for groundwater has contributed to foregone economic development and that a future grant of water rights to SNWA by the Nevada State Engineer (NSE) could foreclose future economic development opportunities. However, neither eventuality is directly germane to BLM's decision on SNWA's ROW application. Rather, the appropriate venue to address these concerns is the NSE hearings on groundwater rights applications, such as the recently concluded hearings on SNWA's water rights applications in the Delamar, Dry Lake, Cave and Spring valley, because: a) the adjudication of water rights is not under BLM's authority, and b) the NSE considers water needs to support future local economic development in the adjudication of water rights and approval of trans-basin diversions. White Pine County and others participated in those hearings.

Standard Resource Responses

Common ID		Standard Response
SocEcon-5 (Continued)		SNWA's applications are all within Nevada precluding any historical effects in the Utah portion of the Snake Valley. The future adjudication of water rights in the Utah portion of the Snake Valley would be contingent on future agreements regarding allocation of water rights between Nevada and Utah. Text has been added in several locations in Section 3.18 to provide additional discussion regarding these concerns as part of the required NEPA disclosure.
SocEcon-6	Failure to disclose full economic costs	A number of comments received on the Draft EIS stated that the EIS failed to disclose the full economic cost of the project, although it is unclear how the commenters define economic cost. As noted in SocEcon-1 and SocEcon-3, new text has been added to the Final EIS to address the direct monetary costs associated with the project. Those additions, along with information contained in Section 3.18, serve to describe the economic costs of the project in broader terms. Section 3.18 describes both short-term and long-term costs to local governments to serve project-related demands. The acquisition of private property and water rights by SNWA, which may affect public sector revenues also are described. Potential effects on the local agriculture industry, tourism, and recreation, and on communities associated with long-term pumping and drawdown are identified. Standard R. R. SocEcon-5 also notes the potential effects on economic development. However, the timing, magnitude, and specific locations and communities affected, are highly uncertain and speculative, due to the long time horizons, uncertainties associated with environmental responses to drawdown, and general uncertainties surrounding the economic future of rural areas in Nevada and Utah. When considered together, the BLM believes that the EIS provides the public and the decision maker information regarding the potential economic costs associated with the project.
Cumulative		
Cum-1	Impacts over time	Thank you for expressing your concerns related to potential impacts created over time. Both Construction and Mitigation Plans would address development in areas of threatened and endangered species habitat, and perennial stream drainages. Appropriate plans would be developed in cooperation with the BLM and the USFWS prior to construction.
Monitoring and Mitigation		
MM-1	General Monitoring and Mitigation	The monitoring, management, and mitigation program for this project is complex and extensive. The following two monitoring and mitigation processes have been developed: 1) Stipulation agreements between the DOI agencies and SNWA to resolve DOI agency protests of SNWA water rights applications with the Nevada State Water Engineer - including monitoring, management, and mitigation requirements. The BLM is a signatory to those agreements, as are other DOI Bureaus (see Appendix C); and 2) the BLM in its role as manager for federal lands under FLPMA, has implemented a process for developing a project-wide COM Plan to protect, minimize, or mitigate impacts to federal resources potentially impacted by construction, operation, and maintenance of the project-related facilities. The framework for development of a COM Plan is presented in Section 3.20 of the Final EIS. The framework for developing a COM Plan provides a structure to define the current and future process for establishing a comprehensive monitoring, management, and mitigation plan. The BLM will require a complete COM Plan for this NEPA programmatic EIS and subsequent NEPA tiers, prior to granting ROWs, and subsequently, prior to groundwater withdrawals. As described in Section 3.20, monitoring, management, and mitigation programs related to future groundwater development would be included in subsequent NEPA and associated valley-specific COM Plans.

Standard Resource Responses

Common ID		Standard Response
MM-2	Monitoring and Mitigation related to Section 3.20 in the EIS	Section 3.20 provides information on a framework for a process to develop COM Plans to identify and avoid, minimize, and mitigate potential adverse environmental impacts of SNWA's project. For groundwater development, the precise level of impact, including the location, nature, and extent, currently is unknown and cannot be determined until specific groundwater development, location, and volumes have been identified. The goal of adaptive management is to maintain ecosystem health. More detailed ecosystem health objectives would be formulated and considered in future site-specific NEPA review and implemented for future ROW grants. This section also includes information on a process for incorporation of triggers or "early warning thresholds." Thresholds would be defined, and made available for public review and comment, as part of specific adaptive management processes and plans that may be considered during future site-specific NEPA review and before ROWs for groundwater development facilities are authorized. Clarification has been added to section 3.20 that it applies to the entire region of study that could be affected by groundwater withdrawals and provides additional guidance and process not currently part of the stipulated agreements. Given the programmatic nature of the NEPA review of future groundwater development in this EIS, the specific elements of future adaptive management plans are not currently known. BLM anticipates that the effects of adaptive management processes or plans would be considered and evaluated as part of the alternatives analyzed in future site-specific NEPA review for groundwater development facility ROWs. Section 3.20 contains a public involvement process that would provide recommendations to inform BLM's decision-making process during the deliberations on whether SNWA's groundwater development has likely caused or contributed to adverse effects, and ultimately whether and what adaptive management measures to employ.
MM-3	Concerns regarding reliance on the Stipulation Agreements	BLM does not rely solely on the DOI stipulation measures to mitigate impacts of proposed groundwater development. Monitoring, management, and mitigation commitments under the DOI stipulations were negotiated to resolve DOI agencies' protests of SNWA's water rights applications before the State Engineer and are incorporated into the proposed action as design features. In addition, in its independent role as federal land manager, the BLM considers potential conditions of approval on the ROW grant to mitigate impacts to federal resources and federal water rights. The COM Plan has been revised to more clearly address these issues at this programmatic stage.