

Comment #	Original Comment	Original UDWR Response	BLM Comment Disposition	UDWR Response
BLM 504	<p>“The local groundwater drawdown effect would be temporary (occurring through Intake Pump Station underground construction) and would recover to match the unaffected sandstone aquifer levels following construction completion. The drawdown effects would be short-term and localized, and would have no effect on other wells in the vicinity used for water supply.”</p> <p>Why wouldn’t this drawdown effect be permanent, since there would be new trenches installed that could affect groundwater? How is it known for certain that “the drawdown effects have no effect on other wells in the vicinity,” since groundwater connectivity is so complex?</p>	<p>Groundwater would be drawn down temporarily during construction. After the tunnels accessing Lake Powell are constructed, flow into the Intake pump system would come from Lake Powell because water flows along the path of least resistance, and drawdown around the Intake Pump Station would be limited to the water level in the shaft which will not draw down measurably from pumping once connected to the lake. Trenching in the vicinity of the Intake Pump Station will be well above the water table, hence no impacts to groundwater would occur. No change to the text is needed.</p>	<p>Disagree with UDWR ... we don’t know exactly how groundwater flow would be affected due to the complexity of these systems. Suggest it should say that draw down effects would “... likely not affect other wells in the vicinity due to the LPP proposed trenching occurring well above the water table.” Please make this edit.</p>	<p>Please see the attached Extended Narrative document for the response to BLM Comment No. 504.</p>
BLM 683	<p>6th line on page: Is it known whether or not the forebay reservoir will be lined? Change to “will be” (vs. “may be”).</p>	<p>At this time it is not known that the forebay reservoir would be lined. UDWR’s view is that no revision to the text is needed.</p>	<p>If it’s not known yet (which creates a problem for the accuracy of the analysis), then we should add a statement here as to why that’s the case.</p>	<p>Text is added regarding the uncertainty of the use of a lining. The text referenced in BLM Comment No. 683 is found in Section 5.3.5.1.3, Chapter 5, Exhibit E of the License Application. The following sentence is added after the fourth sentence of the second to last paragraph of the section: Further geotechnical investigation would determine whether or not the forebay would be unlined, or partially or fully lined.</p>
BLM 684	<p>1st through 3rd lines: The first sentence states that “only one location” could potentially be affected by groundwater-surface water interactions, but then the next sentence lists two locations (Sand Hollow Reservoir and Virgin River). Is it one or two locations that could be affected?</p>	<p>As described in the reference Section 5.3.5.1.3, the potential effects of introducing an increased volume of water to Sand Hollow Reservoir would result in potential surface water impacts at the nearby Virgin River. The location is the Sand Hollow Reservoir and nearby Virgin River. This is a single location, much as “Washington County” is a single location even though it includes St. George, Hurricane, and other locales. UDWR’s view is that no revision to the text is needed.</p>	<p>Then revise the sentence to read “This would be at Sand Hollow Reservoir/Virgin River” (otherwise it appears as though two locations are discussed).</p>	<p>The sentence is revised as requested. The text referenced in BLM Comment No. 684 is found in Section 5.3.5.1.4, Chapter 5, Exhibit E of the License Application. The second sentence of the paragraph is revised to read: This single location would be the area encompassed by Sand Hollow Reservoir and the nearby Virgin River.</p>
BLM 685	<p>4th/5th lines of 1st paragraph: Statement that discharges into unlined reservoirs would occur at two locations is inconsistent with what it says on p. 5-232 (which says only the afterbay reservoir would not be lined). Please correct this inconsistency.</p> <p>Last line on page – TDS acronym has already been defined, so don’t redefine it here.</p>	<p>First Comment Above: The reference on Page 5-232 clearly refers to the three reservoirs constructed as part of the LPP project; the unlined reservoir is clearly identified among these three. Sand Hollow Reservoir, the other unlined reservoir, already exists and will not be constructed as part of the LPP project. UDWR’s view is that that no revision to the text is needed. The suggested edit from the second paragraph from the above comment has been incorporated.</p>	<p>No it is not clear. Please add (to Sec. 5.3.5.1.2) “proposed new reservoirs” after “of these”. Also add that Sand Hollow Reservoir, already in place, is also unlined. That would make this clear.</p>	<p>Clarifying wording similar to the requested text is added. The text referenced in BLM Comment No. 685 is found in Section 5.3.5.1.5, Chapter 5, Exhibit E of the License Application. The first sentence of Section 5.3.5.1.5 is revised to read: Groundwater quality within the LPP area of potential effect may only be affected at the Hurricane Cliffs Hydropower afterbay reservoir and at the existing Sand Hollow Reservoir because discharges into unlined reservoirs would only occur at these two locations.</p> <p>The text in Section 5.3.5.1.3 (formerly Section 5.3.5.1.2), Chapter 5, Exhibit E of the License Application had been revised prior to submittal to FERC as part of the FLA and identifies by name the two open-air reservoirs that are proposed to be constructed as part of the LPP.</p>

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BLM 691	<p>Shallow Groundwater</p> <ul style="list-style-type: none"> • 1st/2nd line on page: BMP acronym has already been defined, so don't redefine it here. • 7th line on page: Where would this disposal of dewatered groundwater occur? Need to delineate/identify that here. • 8th line on page: BMPs such as what? At least need to summarize those measures here (in order to have an accurate impacts analysis). <p>Groundwater Recharge</p> <ul style="list-style-type: none"> • Explain why no effects (can't just say there are none without describing how that conclusion was reached). <p>Groundwater-Surface Water Interactions</p> <ul style="list-style-type: none"> • 1st line: BMPs such as what? At least need to summarize those measures here (in order to have an accurate impacts analysis). Also need more of an analysis ... there isn't enough included to support the claim of no effects. <p>Water Quality</p> <ul style="list-style-type: none"> • 3rd line: Insert "to water quality" after "effects." 	<p>Bulleted responses are in the same respective order as bulleted comments:</p> <ul style="list-style-type: none"> •BMP acronym will not be redefined here. •The location of disposal of dewatered groundwater is yet to be determined. Disposal of dewatered groundwater is a common practice that would require permitting by Utah and Arizona DEQ, subject to approval by the BLM or other land management agency, and would need to meet established protocols for protection of the environment; therefore it is not necessary to present those here. •Refer to second bulleted response. •No water would be produced during construction other than dewatering water, which would either be discharged to the stream channel or would be land-applied or infiltrated nearby. While this could cause an extremely localized recharge effect, it would not result in a net recharge to the groundwater system. Because no water would be added to the system during construction, no analysis is required. <p>UDWRe's view is that no revision to the text is needed.</p> <ul style="list-style-type: none"> •Refer to second bulleted response. •The statement is in the Water Quality section and the intent is evident in the context presented. <p>UDWRe's view is that no revision to the text is needed.</p>	<ul style="list-style-type: none"> •Edit is fine. •Your explanation is good ... it should be added to the document for clarification purposes (not necessarily in this section, but either in the description of alternatives or in the BMPs). •Comment not addressed ... need to discuss potential BMPs to have a valid environmental analysis. •Disagree that no revision is necessary ... need to explain WHY no effects. Add what is in the UDWRe comment response to Exhibit E. •Your explanation is good ... it should be added to the document for clarification purposes (not necessarily in this section, but either in the description of alternatives or in the BMPs). •Can't just say "no effects" without an explanation as to why none. The revised text now says less than the original text did. 	<p>The explanation of dewatered groundwater is added to the document, discussion of potential BMPs is added, and the discussion of "no effects" is expanded. The paragraph discussing "Shallow Groundwater" in Section 5.3.5.2.2.1, Chapter 5, Exhibit E of the License Application is revised to read: Shallow groundwater would be encountered at the Paria River and possibly at the Cane Beds and near Short Creek in the Colorado City area. Shallow groundwater probably would be encountered at the Sand Hollow Hydro Station tailrace adjacent to Sand Hollow Reservoir. Although possible, it is unlikely that shallow groundwater would be encountered elsewhere. BMPs would be incorporated to limit drawdown during construction dewatering to the minimum drawdown necessary for safe and effective construction. BMPs such as trench-blockers would be utilized to prevent groundwater migration along trench bedding where shallow groundwater is encountered. Drawdown would be temporary, no longer than necessary for construction purposes, which would not cause long-term or extensive depletion of groundwater levels or available supplies. Disposal of dewatered groundwater would be performed using BMPs to prevent excessive erosion. Disposal of dewatered groundwater is a common practice that would require permitting by Utah and Arizona DEQ, subject to approval by the BLM or other land management agency, and would need to meet established protocols for protection of the environment. BMPs for groundwater disposal could include land application or infiltration. No water would be produced during construction other than dewatering water, which would either be discharged to the stream channel or would be land-applied or infiltrated nearby. While this could cause an extremely localized recharge effect, it would not result in a net recharge to the groundwater system. Because no water would be added to the system during construction, there would be no measurable or significant effects on groundwater.</p>

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BLM 692	<p>Shallow Groundwater</p> <ul style="list-style-type: none"> • 2nd line: Where would these drain releases occur? Need to delineate/identify specific washes/streams here. • Page 5-232 states that there would be one unlined reservoir, not two. So is this statement about groundwater recharge occurring at two locations accurate? Please correct the inconsistency between these two sections. 	<p>The locations of drains will be determined during detailed design, they cannot be delineated until then, and the detailed design can't be prepared until after approval of the PLP. The reference on Page 5-232 clearly refers to the three reservoirs constructed as part of the LPP project; the unlined reservoir is clearly identified among these three. Sand Hollow Reservoir, the other unlined reservoir, already exists and will not be constructed as part of the LPP project. UDWR's view is that no revision to the text is needed.</p>	<p>Comment not adequately addressed ... BLM does not necessarily disagree with your conclusion, but that conclusion needs to be adequately explained here in THIS section.</p>	<p>Additional explanation is provided. The "Shallow Groundwater" and "Groundwater Recharge" paragraphs in Section 5.3.5.2.2.2, Chapter 5, Exhibit E of the License Application are revised to read:</p> <p>Shallow Groundwater</p> <p>Occasional water releases from pipeline and penstock drains would occur at low points in the profile that would be determined during the design phase of the project. These temporary drain releases to streams and dry washes would have no measurable effects on shallow groundwater. If released surface water recharged to the ground in these streams and dry washes, the resulting effects on shallow groundwater would be positive and intermittent. No significant effects would occur on shallow groundwater.</p> <p>Groundwater Recharge</p> <p>Substantial groundwater recharge would only occur at the afterbay reservoir and at the existing Sand Hollow Reservoir. At the afterbay reservoir, recharge would be to a deep aquifer in the Navajo sandstone utilized by very few groundwater resource users. If any recharge reaches the aquifer, it would result in an increase in groundwater levels. This would be a positive, long-term effect on groundwater resources.</p> <p>Recharge at the existing Sand Hollow Reservoir from LPP water would continue the hydraulic recharge conditions similar to baseline conditions where recharge of Virgin River water occurs. Therefore, no distinguishable or significant effects would occur on groundwater resources.</p>
BLM 693	<p>Groundwater-Surface Water Interactions</p> <ul style="list-style-type: none"> • 1st line: Explain why the water interactions would be the same as baseline conditions (can't just say there are none without describing how that conclusion was reached). 	<p>The reviewer is referred to Section 5.3.5.1.3 for analysis. The effects analysis is presented under Section 5.3.5.1, Affected Environment, and Environmental Effects (impacts) are presented under Section 5.3.5.2. UDWR's view is that no revision to the text is needed.</p>	<p>Comment not adequately addressed ... BLM does not necessarily disagree with your conclusion, but that conclusion needs to be adequately explained here in THIS section.</p>	<p>Further explanation is added. The "Groundwater-Surface Water Interactions" paragraph in Section 5.3.5.2.2.2, Chapter 5, Exhibit E of the License Application is revised as follows: Recharge at Sand Hollow Reservoir from LPP water would continue the hydraulic recharge conditions similar to baseline conditions where recharge of Virgin River water occurs as described in Section 5.3.5.1.4. Groundwater-surface water interactions would be the same as baseline conditions. Therefore, no measurable or no significant effects would occur on groundwater resources.</p>

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BLM 694	<p>Groundwater-Surface Water Interactions</p> <ul style="list-style-type: none"> • 1st line: Explain why no effects would occur (can't just say there are none without describing how that conclusion was reached). 	<p>Under the No Lake Powell Water Alternative, a reduction in potable outdoor water irrigation would occur in the WCWCD service area of St. George and surrounding areas, which would reduce the volume of groundwater recharge. The estimated reduction in residential outdoor potable water use by 2052 (the projected year when all LPP Proposed Action water would be utilized) would be between 51,633 acre-feet per year and 56,724 acre-feet per year when compared to the Proposed Action. UDWRe had estimated that approximately 50 percent of current residential, commercial and institutional irrigation water used for outdoor residential watering is consumed by evapotranspiration, and the remaining 50 percent is recharged to groundwater. This recharge eventually becomes return flow to the Virgin River. The reduction in outdoor water use and water efficiency improvements would reduce the percent of outdoor residential, commercial and institutional irrigation water recharged to the aquifer to about 30 percent of the total. Thus, from 15,490 to 17,017 acre-feet per year (21.4 to 23.5 cubic feet per second, on average) of return flow to the Virgin River would not occur by 2052, a reduction of nonsewered return flows of 68 to 72 percent when compared to the Proposed Action. This would be a measurable, significant impact. This discussion has been included in the text.</p>	<p>Appreciate the added analysis, but the conclusion is based on faulty assumptions. See BLM response for Comment #668. Groundwater recharge is not primarily (or even anywhere close to 50%) due to landscape watering. Thus, this analysis is inaccurate and highly suspect.</p>	<p>Please see the Extended Narrative document for the response to BLM Comment No. 694.</p>

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BLM 695	<p>Shallow Groundwater</p> <ul style="list-style-type: none"> • 3rd line: Only a “minor” effect? <p>What is this conclusion based upon? If depleting an aquifer, this seems like more than a minor impact.</p> <p>Groundwater Recharge</p> <ul style="list-style-type: none"> • Explain why no effects would occur (can’t just say there are none without describing how that conclusion was reached). <p>Groundwater-Surface Water Interactions</p> <ul style="list-style-type: none"> • Explain why no effects would occur (can’t just say there are none without describing how that conclusion was reached). <p>Water Quality</p> <ul style="list-style-type: none"> • Explain why no effects would occur (can’t just say there are none without describing how that conclusion was reached). 	<p>Bulleted responses are in the same order as the respective comments:</p> <ul style="list-style-type: none"> • The text has been changed to indicate that there would be a measurable and significant impact to the aquifer. • UDWRe’s view is that the text is appropriate as written. • UDWRe’s view is that the text is appropriate as written. • The No Lake Powell Water Alternative does not change baseline conditions for groundwater quality, so no effects would occur as a result of the alternative. This statement has been added to the text. 	<p>Comment not addressed ... text still says “minor” effect, which is inaccurate. Contrary to UDWRe’s response, the comment was not addressed in the revised text.</p> <p>Contrary to UDWRe’s response, the comment was not addressed in the revised text.</p> <p>Edit is fine</p>	<p>The level of effects has been corrected. The "Shallow Groundwater," "Groundwater Recharge," and "Groundwater-Surface Water Interactions" paragraphs of Section 5.3.5.2.5.2, Chapter 5, Exhibit E of the License Application are revised and are shown below:</p> <p>Shallow Groundwater</p> <p>The Kanab Creek aquifer would be further developed to meet demands for M&I water in the KCWCD service area for Kanab and Johnson Canyon. The shallow aquifer associated with Kanab Creek would be further depleted. This depletion would have a measurable and significant effect on groundwater resources in the Kanab area.</p> <p>Groundwater Recharge</p> <p>The No Lake Powell Water Alternative does not involve any activities which would result in water infiltrating to the groundwater, so effects would occur as a result of the alternative.</p> <p>Groundwater-Surface Water Interactions</p> <p>The No Lake Powell Water Alternative does not involve any activities which would result in surface water interacting with groundwater, so no effects would occur as a result of the alternative.</p>
BLM 701	<p>2nd line: Stabilization and erosion control measures such as what? At least need to summarize those measures here (in order to have an accurate impacts analysis).</p> <p>7th line: What would be done with these drilling fluids?</p>	<p>Stabilization and erosion control measures will be developed as part of the detailed design, which can’t be prepared until after approval of the PLP. BMPs will be consistent with requirements of BLM on BLM-administered lands. Drilling fluids would be managed and disposed of as required by drilling permits to be issued to the drilling contractors, specific to the application. UDWRe’s view is that no revision to the text is needed.</p>	<p>Text is not okay as is ... please incorporate what was written in the comment response.</p>	<p>The UDWRe comment response text is added. The text referenced in BLM Comment No. 701 is found in Section 5.3.5.3.1.5. The text of Section 5.3.5.3.1.5, Chapter 5, Exhibit E of the License Application is revised to read: Construction locations with severe channel instability problems would be avoided. Stabilization and erosion control measures would be implemented to prevent any increase in sedimentation, siltation and turbidity to the stream as a result of construction activity. Stabilization and erosion control measures would be developed as part of the detailed design. BMPs would be consistent with the requirements of BLM on BLM-administered lands or other federal land management agencies as appropriate. Runoff and contaminants from staging areas would be prevented from entering stream and dry washes by using secondary containment structures. Directional drilling may be used in geologically sensitive locations to minimize potential for groundwater contamination. All drilling fluids would be captured and accounted for during drilling activities. Drilling fluids would be managed and disposed of as required by drilling permits to be issued to the drilling contractors, specific to the application.</p>
BLM 702	<p>2nd line: Need to add that waste generated on public lands would need to be removed from the public land to an acceptable/approved disposal site.</p>	<p>The statement that wastes would be disposed of in accordance with prevailing codes and regulations includes management and removal of construction wastes on public lands. UDWRe’s view is that no revision to the text is needed.</p>	<p>It does? I’d still like to have this comment inserted.</p>	<p>The BLM text is added. Section 5.3.5.3.1.7, Chapter 5, Exhibit E of the License Application is revised to read: All construction waste generated would be handled, stored and disposed of under prevailing codes and regulations. Wastes generated on public lands would be removed from public lands to an acceptable/approved disposal site. Lined containment structures would be used where applicable to prevent groundwater contamination from construction waste.</p>
BLM 704	<p>Last line: This is not the aquatic resources section, so remove this reference to impacts on aquatic resources.</p>	<p>The comment appears to apply to Section 5.3.5.5.4. The suggested edit has been incorporated to that section.</p>	<p>While the requested text was deleted, the analysis on impacts to ground water from this alternative is totally inaccurate. See BLM comment on UDWRe response to Comment #694.</p>	<p>The effects of the No Lake Powell Water Alternative were discussed during the meeting between BLM and UDWRe on March 17, 2017. Based on these discussions we understand that BLM’s primary concern is that USGS documents cited in the analysis of changes to urban groundwater recharge appear to contradict the conclusions of the groundwater impact analysis in the environmental report. The impact analysis for the alternative is based on localized recharge of the shallow subsurface soils in the vicinity of the urban irrigation and describes the potential effects of changes to this groundwater resource from the alternative. UDWRe agrees with BLM that these site-specific changes in groundwater conditions are not in total agreement with conditions described in the two USGS reports. We recognize these differences do exist and suggest the cited USGS documents describe groundwater conditions at a different scale than is described in the impact analysis for the alternative as the reason for the differences. In addition to the response below, please refer to attached Extended Narrative document for the response to this comment and BLM comment No. 694.</p> <p>The following sentence is added as the first sentence of section 5.3.5.5.4, No Lake Powell Water Alternative, Chapter 5, Exhibit E of the License Application: The effects of the No Lake Powell Water Alternative presented below are localized,</p>

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BLM 705	NEW SUB-SECTION: There needs to be a sub-section on analysis of impacts from the No Action Alternative (which is currently missing) – please add.	The comment appears to mean that a new subsection 5.3.5.5.5 should be created. The suggested edit has been incorporated.	Thank you for adding the new sub-section, but it needs to explain why no unavoidable adverse effects (it should be obvious to the reader, but we still need to describe it). And why would the effects under this alternative not be the same as with the No Lake Powell Water alternative? Seems like it should be.	<p>The differences between the No Action Alternative and the No Lake Powell Water Alternative were discussed in the meeting between BLM and the proponent on March 17, 2017. Please see the response to BLM No. 667 in the attached Extended Narrative document for a partial response to BLM No. 705. There would be unavoidable adverse impacts from implementation of the No Action Alternative. The first paragraph in Section 5.3.5.5.5, Chapter 5, Exhibit E in the License Application is revised to read: The No Action Alternative would have unavoidable effects on groundwater resources in the St. George metropolitan area. Growing demand for culinary water by the growing population would result in all existing and planned groundwater wells being developed, with depletion of remaining groundwater supplies from local aquifers. Depletion of groundwater supplies would result in reduced groundwater production from wells and higher pumping costs. Agricultural irrigation ultimately would not occur and groundwater recharge would not occur as a result of agricultural irrigation. These unavoidable adverse effects on groundwater would be long-term.</p> <p>The unavoidable adverse effects on groundwater under the No Action Alternative would be different from the No Lake Powell Water Alternative, because the latter is an action alternative that would have additional unavoidable adverse effects on groundwater resources. Please see the response to BLM Comment No. 667.</p>