Responses to Stakeholder Comments and Study Requests – November 2018

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
SRP	Overarching Concerns	Likely adverse impacts on senior water rights held by SRP shareholders and others to the Verde River.	As part of the groundwater modelling study, ITC will identify potential measures that will mitigate identified adverse impacts to the Verde River. The mitigation measures will avoid adverse impacts to senior water rights.
		Likely cause injury to the endangered and threatened wildlife and habitat that depend on the water flows into the Upper Verde River and adversely impact SRP's rights under its June 2008 incidental take permit and associated Habitat Conservation Plan.	ITC intends to mitigate any potential effects of ITC pumping on Verde River flows; as a result, there will be no adverse impacts to endangered and threatened wildlife and habitat.
		Likely violate the Wild and Scenic Rivers Act, including the Outstandingly Remarkable Values for which it was established.	ITC disagrees with SRP's assertion that the Project is likely to violate the Wild and Scenic Rivers Act.
	Numbered Point I	Groundwater use for the Project should have zero impact on water levels in the Big Chino Sub-Basin and Verde River base flow.	ITC will identify and implement measures to mitigate identified adverse Project impacts to the Big Chino Sub-Basin and Verde River base flow.
	Numbered Point I	ITC took none of SRP's recommendations on the Project Groundwater Modelling Plan.	Preliminary modelling was undertaken prior to receiving input from SRP. ITC is working with stakeholders, including SRP, to further develop, update, and refine the groundwater modelling.
	Numbered Point I	ITC's preliminary modelling efforts do not demonstrate a commitment to develop a robust and accurate model of impacts.	The preliminary modelling effort provided an estimate of the Project groundwater impacts and effectiveness of mitigation effects on the aquifer, with the understanding that a refined model reflecting stakeholder input and updated information will produce better results.

Responses to Stakeholder Comments and Study Requests – November 2018

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
	Numbered Point I	ITC must develop a robust, accurate, and reliable model to simulate the effects of its pumping on the Big Chino aquifer and the base flow of the Verde River.	ITC is committed to using an improved groundwater flow model to develop an estimate of the identified impacts of Project groundwater use and mitigation efforts on the aquifer and connected Verde River. This model will be utilized to accurately simulate the known aspects of the aquifer while simulating poorly defined aspects of the aquifer in a way that does not underestimate the net Project impacts.
	Numbered Point I	The current model plan and preliminary findings do not meet obligations to FERC and the Stakeholders.	The groundwater modelling study, which is developed and implemented through consultations with stakeholders, is consistent with FERC's requirement that ITC identify and assess potential Project effects. ITC is confident that the final study report will comply with FERC's licensing requirements and meet the needs of stakeholders.
	Numbered Point II	The ITC Groundwater Resources Modelling Study Plan and activities will not provide adequate results to simulate Big Chino Project's impacts on the Big Chino aquifer and Verde River.	The groundwater modelling study will produce a conservative estimate of Project impacts, meaning net impacts of Project groundwater use will not be underestimated and the impact of mitigation measures will not be overestimated.
	Numbered Point II	NARGFM is a regional model that oversimplifies the system in the Big Chino and is not capable of reliably predicting the locations and timing of impacts of withdrawals and mitigations.	NARGFM simulates all of the main hydrogeologic features of the Big Chino region and at an appropriate resolution using a grid spacing of 1 km. These features will be updated for improved representation using additional data in the update of NARGFM that will occur as part of ITC's groundwater modelling study. The regional nature of the model is a benefit because it allows accurate simulation of groundwater divides as transient features rather than artificial boundaries. The combined effects of Project withdrawals and mitigations can be estimated through reducing non-Project groundwater use.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
	Numbered Point II	Long-term water-level records are needed.	We have much better long-term water-level records in the Big Chino region than when the NARGFM was first developed. Additionally, many more wells are being regularly monitored than when NARGFM was developed. This new data will be incorporated into the updated NARGFM model.
	Numbered Point II	Hydraulic connections across many parts of the aquifer system are poorly defined.	The system as currently conceptualized and simulated in NARGFM assumes good hydraulic connections among the various aquifer units. As a consequence, the model calculates rapid effects of groundwater withdrawals on streamflow. This ensures that Project impacts are not underestimated.
	Numbered Point II	Steep hydraulic gradients near Walnut Creek are poorly understood.	The gradients may be explained by different hydrogeologic concepts. The NARGFM provides the ability to simulate the simplest concept of a well-connected system.
	Numbered Point II	Reasonably accurate distributions of recharge rates need to be known.	This statement in the NARGFM report that the comment refers to addresses criticisms of the model regarding the lack of simulation of ephemeral channel recharge. We believe it is a minor concern in comparison to other concerns as the net effect of distributing recharge along channels would be to reduce recharge in upland areas by the amount added to downstream channels. The change in recharge distribution would not change the overall rate of groundwater flowing through the aquifer. Accordingly, the aquifer response to groundwater withdrawals would be similar for both realizations of recharge distributions.
	Numbered Point II	Aquifer storage properties are poorly defined.	Where aquifer storage properties lack definition, a low storage coefficient will be assumed, resulting in a high estimate of aquifer diffusivity.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
	Numbered Point II	Use of the entire NARGFM domain is not appropriate because the area of interest is a small portion of the model and the grid resolution is too large to represent the area of interest.	Use of a regional model is a superior approach than use of a basin-scale model with artificial boundaries along assumed groundwater divides. Pumping can cause groundwater divides to move, but the boundaries in a basin-scale model are rigid. Furthermore, use of the ADWR sub-basin boundary imposes a flow system that probably does not truly represent the actual Big Chino groundwater sub-basin. Regarding grid resolution, small scale variations in aquifer properties of the order of 1 km or smaller cannot be defined by existing data. But variations at this scale will have limited effect on the simulated impacts.
	Numbered Point II	Extension of the NARGFM stress periods an additional 8 years is inadequate.	Stress periods will be modified for the years 2000–2005 and extended through 2017. This period includes nearly all of the observations of large changes in water-level and streamflow in response to changes in recharge and withdrawal rates in the region. The period includes new updated data, previously unavailable, to improve the calibration of the model and to improve its ability to simulate change.
	Numbered Point II	The updated NARGFM will undoubtedly show the Project groundwater use will cause water-level decline and significantly reduced flow in the Verde River.	The updated NARGFM will be used to determine a conservative estimate of Project effects on the aquifer and Verde River, as well as a means to evaluate the extent and effectiveness of methods to mitigate such effects.
	Numbered Point III	ITC should gather sufficient data, develop an accurate conceptual model, and build a robust numeric model to meet its obligations to FERC and Stakeholders.	ITC is gathering available data and using the information to modify and improve NARGFM. The existing conceptual and numerical model is a reliable tool that will produce reasonable estimates of the Project's impacts to aquifer and streamflow.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
	Numbered Point III	Additional hydrogeologic data should be gathered including geologic, geophysical, geochemical, and hydrologic data to physically characterize the aquifer and identify data gaps.	Much more subsurface and hydrologic data, particularly showing change, are available from geophysical surveys, well drilling, well testing and monitoring than were available for the original NARGFM. We are encouraging all Stakeholders, including SRP, to make available all pertinent hydrologic data so that they can be incorporated in the modelling effort. Where data gaps remain, assumptions that result in rapid aquifer response to withdrawals will be used.
	Numbered Point III	Use the data to develop a conceptual model of the Big Chino aquifer to properly guide the development of a numeric model.	The conceptual model used to develop NARGFM will be used as it is appropriate for simulating a highly diffusive aquifer that responds quickly to withdrawals.
	Numbered Point III	Develop a numerical model based on the conceptual model that will simulate subsurface flows to the Verde River.	See response to previous comment.
	Numbered Point III	Allow Stakeholder access and input into the development and calibration of the numeric model to increase its reliability.	Data sets gathered by the Project will be shared with Stakeholders where data owners allow. Stakeholders do have input into the development and calibration of the model.
	Numbered Point III	A number of simulations should be run and sensitivity and uncertainty analysis should be completed.	Sufficient uncertainty analysis will be completed to establish aquifer parameters that will produce a conservative estimate of Project effects on the aquifer system and Verde River.
	Numbered Point III	Data collection to accurately characterize the aquifer properties can be costly and time consuming. However, this step is critical to accurately predicting impacts to the aquifer and Verde River.	Data documenting transmissivity distributions are robust, but data on storage properties are limited. However, recent information defining the extents of silt and clay confining units and associated low storage coefficients are available from USGS geophysical surveys including gravity monitoring at wells.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
	Numbered Point III	The conceptual model should include aerial and vertical extent of the active area of the model based upon underground water divides.	The approach suggested requires the use of artificial boundaries in place of the natural flow boundaries used in NARGFM. To better understand concepts related to groundwater divides as model boundaries see USGS Circular 1376, page 66 and accompanying figure 45 which defines the best management practices for boundaries and were used for this model.
	Numbered Point III	The conceptual model should include model layers.	Agreed. The original NARGFM model was layered. Distribution and properties of layers may be modified where justified by available data.
	Numbered Point III	The conceptual model should include cell size sufficient for layer heterogeneities and the Holocene alluvium to be included in the model.	There is no method of efficiently obtaining information on aquifer heterogeniety at distances of less than about 1 km across large parts of the basin. Other than detailed geophysical surveys, obtaining sub-km resolution would require hundreds of wells across the valley at less than 1km distances, with continuous water-level and withdrawal monitoring at all wells. Such an approach is not feasible.
	Numbered Point III	The conceptual model should include orientation of the model so that anisotropy can be included.	ITC agrees. More specifically, the conceptual model should include concepts of the hydraulic conductivity tensor. NARGFM was oriented in this manner to simulate likely anisotropy.
	Numbered Point III	The conceptual model should include distributions of natural and artificial recharge and changes in the distribution over time as a result of both surface water diversions on Big Chino Wash, Williamson Valley Wash, Partridge Creek and Walnut Creek and changes in crops and irrigation methods in the Sub-basin.	Diversions of surface water for agricultural irrigation in the Big Chino area are limited. Variations in irrigation recharge are accounted for in NARGFM by explicitly including recharge of excess applied irrigation water based on a study of withdrawals and consumptive use (Yavapai County, 2004).

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
	Numbered Point III	The conceptual model should include location and extent of perched aquifer.	The perched aquifer intercepts infiltrating recharge and transports that flow to the margins of the perched aquifer where it percolates and recharges the primary aquifer. NARGFM does not simulate this process but simulates direct percolation to the main aquifer. The perched aquifer interception and diversion process is not likely to have a significant impact on the simulation of the effects of groundwater withdrawals in deeper aquifers.
	Numbered Point III	The conceptual model should include thickness and extent of the Tertiary deposits.	The thickness and extent of Tertiary deposits is being modified based on geophysical surveys and borehole data.
	Numbered Point III	The conceptual model should include thickness and aerial extent of low permeability silt and clay sediments in the Tertiary deposits.	Modifications are being made to the silt and clay extents based on geophysical studies and borehole data.
	Numbered Point III	The conceptual model should include thickness and extent of Tertiary extrusive volcanic sediments.	Modifications are being made to the subsurface volcanic extents based on geophysical studies and borehole data.
	Numbered Point III	The conceptual model should include thickness and extent of Paleozoic sediments.	Modifications are being made based on geologic mapping, geophysics, and borehole data.
	Numbered Point III	The conceptual model should include orientation and significance of the fault and fracture network present in both the Tertiary volcanic and Paleozoic sediments.	At basin scale, fractured systems are normally simulated as equivalent porous media.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
	Numbered Point III	The conceptual model should include location of the Upper Verde Springs and how their discharge has decreased over time.	The main concern for simulating withdrawal effects on streams and springs is the distance between the springs and withdrawals. Simulation of spring location within a 1km distance is not a significant factor because distances to any withdrawal wells of concern is greater than several kilometers. The model will simulate variations in Verde River flow above the Paulden gage and above the SRP Campbell gage.
	Numbered Point III	The conceptual model should include surface water and groundwater calibration targets using significantly more targets than included in NARGFM.	More calibration targets will be included than were used in NARGFM because of the greater numbers of monitoring locations and observations of water level change and streamflow since 2005.
	Numbered Point III	The conceptual model should include a Sub-basin mass balance that includes well based annual estimates of surface water inflow and outflow, underground water inflow and outflow, evapotranspiration from native plants and crops, groundwater pumping, natural and artificial recharge from predevelopment to the present.	A mass balance will be included for all of these items. This is standard best practices procedure for groundwater flow modeling.
	Numbered Point III	The conceptual model should include methods to estimate changes in temporal and spatial pumping.	Estimates of withdrawal distributions are based on documented studies including an extensive study by Yavapai County (2004) and ongoing USGS monitoring beginning in 2013.
	Numbered Point III	The conceptual model should include changes in native plant evapotranspiration over time as a result of agricultural and residential development in the Sub-basin.	Changes in evapotranspiration will be included. We are unaware of any other changes in vegetation that access groundwater other than irrigated agriculture and flooding along the Verde River.
	Numbered Point III	The conceptual model should include basis for and the validity of the NARGFM interpretation that underground water discharges from the Big Chino Sub-basin to the Coconino Plateau.	NARGFM simulates groundwater divides based on physically-based recharge distributions and hydraulic gradient-based aquifer properties. NARGFM does not simulate groundwater divides coincident with the sub-basin boundary and therefore simulates groundwater flow across that boundary.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
	Numbered Point III	The conceptual model should include temporal changes in groundwater and surface water discharges from the Little Chino Sub-basin and their effects on groundwater in the Sub-basin and the flow in the Verde River.	This will be considered and is simulated by NARGFM.
	Numbered Point III	The conceptual model should include methods to incorporate uncertainty in model input.	Uncertainty of observations and estimated parameters will be considered.
	Numbered Point III	MODFLOW 2005 is recommended as the platform for its numeric model.	We agree this is the best platform to facilitate sharing with Stakeholders.
	Numbered Point III	Use industry standard software to calibrate the model.	MODFLOW-2005 with Groundwater Vistas and Pest will be used.
	Numbered Point III	Perform sensitivity and uncertainty analyses including an observation or sensitivity, the adequacy of observation spatial/temporal distribution, an evaluation of the sensitivity of the model predicted Project pumping impacts to model inputs, and a rigorous uncertainty analysis that results in a statistical/confidence interval type presentation of model predictions.	Much of the requested work will be completed. However, an uncertainty analysis that includes all combinations of possible variations in parameters (e.g., Monte Carlo) will not be performed. However, ITC will consider extreme examples of aquifer diffusivity, the parameter of substantial importance to the effects of ITC withdrawals and mitigation.
	Numbered Point III	ITC should provide the model input/output, sensitivity analysis, and uncertainty analysis files to Stakeholders.	This information will be provided to Stakeholders.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
		ITC should provide a report that clearly and accurately describes the elements of the conceptual model, the basis for important model decisions, the numeric model, the numeric model results, and the sensitivity and uncertainty analyses.	A report describing the model will be prepared as is suggested here.
	Numbered Point III	SRP recommends that ITC develop a realistic schedule to gather Stakeholder input, collect the necessary new data, analyze the data, create and calibrate the model, and, complete sensitivity and uncertainty analyses.	ITC believes that Stakeholders have significant opportunity and time to provide input into the development and review of the groundwater modelling study, particularly through participation in the groundwater modelling stakeholder group. For example, Stakeholders will have at least 2 opportunities to comment on calibration and sensitivity analyses and similar opportunities to comment on simulated scenarios and model results.
	Numbered Point III	The schedule should include a communication plan that provides adequate time for Stakeholders to review and comment at important points during completion of modelling and the modelling report. Specific ways to provide periodic status and schedule updates to Stakeholders and allow access to maps, cross sections, and computer files should be included in the plan.	Stakeholders will be provided with access to data sets developed for the model and opportunities to comment before and after use of the data. A data portal will be organized and shared with the Stakeholders.
	Numbered Point IV	ITC's recent submission of its report on preliminary groundwater modelling shows its current groundwater modelling plan is insufficient to analyse the impacts of its proposed pumping on the Big Chino aquifer and Verde River.	ITC’s initial report describing preliminary modelling does not address the current modelling effort that is being developed and implemented in consultation with the Stakeholder working group.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
		Results of the Preliminary groundwater modelling are flawed because of NARGFM limitations of a regional model that has not been updated based on SRP recommendations.	NARGFM is reasonable and appropriate model to assess the impacts associated with Project withdrawals because it simulates all major features of the Big Chino hydrogeologic system at an appropriate scale and uses reasonable aquifer properties.
		Verde River depletion rates based on the analysis are flawed because the simulated depletion rate of 0.15cfs is on the order of 0.01% of NARGFM recharge rates and on the order of typical mass balance errors of 0.05 to 0.01%.	Use of percent mass balance error is an incorrect way of evaluating the model's ability to compute capture or streamflow depletion. What is important is that mass-balance error in cubic meters per day (not percent) is much smaller than the rate of added pumping in cubic meters per day. In the preliminary modelling, NARGFM was able to accurately compute streamflow depletion, as evidenced by the well-behaved capture curve in the appendix of the report. There is no reason to think that an improved NARGFM would not be able to accurately compute streamflow depletion also.
		Reported Verde River depletion is incorrectly calculated as the increase of the Big Chino Project's pumping beyond that of the net historical irrigation. The actual reduction in Verde River flow will be the full amount of the Project's pumping (net historical pumping + the increase in Project pumping over and above the historical pumping) because the historical irrigation pumping is already reducing the flow in the Verde River.	The effect of the ITC withdrawals on the Verde River is superimposed on the effects of historical and future non-Project withdrawals assuming non-linear changes in the system are minimal throughout the simulation period. The Project withdrawals and offsetting mitigation measures, for both short term to construct and to fill the reservoirs and for long-term operations, will result in no net increase in groundwater withdrawals from the aquifer. Accordingly. no reduction in Verde River flow will result from the Project. The Project is also looking to further reduce water use for long-term operations that would result in a net benefit to the aquifer and the Verde River.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
		ITC plans to retire pumping at the CV Ranch to reduce the impacts of its project pumping. ITC should be careful not to overstate the impacts of reduced pumping as the reduction is only limited to the actual consumptive use of the crops irrigated.	ITC is well aware of the need to use consumptive use as an estimate of net groundwater withdrawals and plans on using a conservative estimate of the consumptive use on the farm to be retired.
		ITC risks overstating the impacts and frequency of recharge events in the Sub-basin as most precipitation events do not produce significant recharge volumes, are limited in duration, and should not be modelled across large areas.	ITC's analysis assumes long-term recharge rates are similar to the recorded past and equivalent to steady-state recharge rates simulated by NARGFM. Moreover, recharge rates are transparent to analysis of the ITC Project withdrawals unless future recharge rates would cause significant changes in aquifer thickness.
		The flawed results provided in the preliminary report are further evidence that without the model modifications suggested by SRP, FERC and the Stakeholders cannot have confidence in the predicted impacts of the Big Chino Project. More importantly, the risk is high that the Verde River will decline substantially during the life of the Big Chino Project.	Responses to comments above on the preliminary model report explain that the results are not flawed. The preliminary modelling using an unmodified NARGFM was a responsible effort by ITC to understand the possible effects of Project withdrawals on the Verde River. Sharing the report allows transparency between ITC and Stakeholders. The report and transmittal cover letter fully explain that the effort was preliminary and should not be considered a final result.
	Numbered Point V	Additional recommended studies:	
		A. A study of water rights issues.	ITC is not proposing a licensing study to study water rights. However, ITC will comply with all applicable legal requirements regarding water rights for the Project.
		B. Alternative Water Supply Study.	ITC is not proposing a FERC licensing study for alternative water supplies but is currently analyzing the feasibility of accessing alternative water supplies as part of its feasibility studies.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
		C. Transmission grid impact study.	ITC will comply with all applicable requirements of the Federal Energy Regulatory Commission regarding the interconnection of the Project to the interstate transmission grid. The requirements include an assessment of interconnection and reliability related issues.
		D. Study the impacts to Threatened and Endangered Species and other sensitive species in the upper Verde River which should be based upon the improved water modelling study.	ITC will demonstrate that the Project, as proposed in the licensing application submitted to FERC, will not deplete the Verde River, thereby maintaining flows that support threatened, endangered, and other species.
Yavapai-Apache Nation	Study Request #1	A Water Rights Analysis Study should be conducted with objectives of examining and determining (1) what legal entitlement the Applicant has to appropriate waters for the Project; (2), the priority or priorities associated with this right, and (3) whether or not, in this fully appropriated system, Applicant can legally appropriate these waters, and if not, (4) what sort of mitigation or other actions should be taken to protect senior downstream rights.	ITC will ensure that its use of groundwater for the Project will comply with all applicable legal requirements.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
	Study Request #2	A study should examine how ITC's proposal to temporarily or permanently retire existing irrigation on lands associated with the Project will provide a net benefit to the aquifer and the Verde River with objectives to determine (1) the amount of legally available water rights or historic water uses could be retired in the Project area; (2) whether future pumping could be minimized in the area (through conservation easements or otherwise), and (3) how such an actions could offset or mitigate Project's impacts on the aquifer and the Verde River and the numerous resources associated with the Verde River.	The groundwater model study will evaluate the effect of reduced consumptive use of groundwater toward mitigating the impacts of Project withdrawals on the aquifer and Verde River.
	Study Request #3	A study should be conducted to examine availability and feasibility of using alternative sources of water for the Project initial fill and to replace evaporation and other losses.	ITC is currently assessing the potential use of water resources for the Project.
Salt River Pima-Maricopa Indian Community		Fully and completely study the potential impacts to the surface flow of the Verde River associated with the proposed project, including the initial reservoir fill and subsequent annual project operation.	The current groundwater model study will not under-estimate the effects of Project withdrawals nor over-estimate mitigation options on the Verde River flows. The assumptions in the groundwater model ensure that the effects of Project consumptive use will not be underestimated, and the model will conservatively estimate aquifer and streamflow impacts.
		Evaluate any impact surface flow reductions would have on habitat for the Desert Nesting Bald Eagle.	ITC intends to implement measures that will mitigate identified Project effects on streamflow and associated habitat.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
		It is not clear whether reported agricultural water use of 3,000-4,000 acre-feet per year on Project lands refers to consumptive use or the amount of the agricultural usage that returns to the aquifer through return flow, etc.	A range of estimates of groundwater consumptive use exist for the farm lands that are proposed for retirement. ITC will assume the lower range of the estimate so as to be conservative in estimating impacts of the Project on the Verde River.
Towns of Clarkdale, Jerome, and Camp Verde	Study Result 1	Clearly and unequivocally identifies the consumptive value of the Big Chino Pumped Storage Project on the aquifers that supply the base flow of the Verde River, assuming no mitigation. Also address any potential water quality changes or impacts.	The assumptions in the groundwater model ensure that the effects of Project consumptive use will not be underestimated, and the model will conservatively estimate aquifer and streamflow impacts. Project induced changes in hydraulic gradients that could change groundwater quality will be evaluated on the basis of the groundwater flow modelling.
	Study Result 2	Identifies a possible suite of mitigation strategies that address this consumption.	ITC is developing a range of possible mitigation options that will be documented and shared with Stakeholders.
	Study Result 3	Clarifies that mitigation will have no negative impact on the Verde River's headwaters, neither during start-up nor during the entire life of the project including any potential post-mitigation water quality changes.	The groundwater model will be used to evaluate mitigation strategies that mitigate impacts to streamflow at the Verde River headwaters and downstream areas.
	Study Result 4	Shows both the unmitigated and mitigated impacts of the project on the Verde River's seasonal base flows at: Headwaters Springs; Perkinsville; below the confluence of Sycamore Creek and the Verde River; Lower Tapco River Access Point; 89a Bridge in Cottonwood; below the confluence of Oak Creek and the Verde River; at Black Bridge in Camp Verde; at White Bridge in Camp Verde.	See response to previous item.

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
	Additional concern	We seriously question the necessity or appropriateness of not including the geographic scope of the Verde River in licensing studies given the already generally accepted hydrologic information about the connection of the Big Chino aquifer to the headwaters of the Verde River. This approach appears to be inconsistent with the statement in its August 6, 2018, Stakeholder Comment Response Matrix that "ITC is currently undertaking an evaluation of the potential impacts of its proposed groundwater withdrawal to the Big Chino Aquifer and the Verde River." Matrix at page 2.	The current investigation of Project impacts on Verde River flows through the groundwater model includes parts of the Upper Verde River including the Headwater's Springs, Perkinsville, and the USGS streamflow gaging station near Clarkdale. If Project impacts cannot be mitigated, the geographic scope of licensing studies will be expanded appropriately.
8/28/2018 USFWS Arizona Ecological Services Office	16	An analysis of impacts on T&E species, habitats and critical habitats on the Verde River that includes incorporation of the most current hydrogeology and updated groundwater and climate model data for the Big Chino Basin.	ITC is currently engaged in a groundwater study that will determine identified effects of the Project on the Verde River and associated habitats. If Project impacts cannot be mitigated, the geographic scope of licensing studies will be expanded appropriately. .
	17	A model of potential effects to riparian vegetation, base flow, and stream temperatures in the Verde River from the project under different climatic scenarios with the most current hydrogeology and updated groundwater and climate model data for the Big Chino Basin.	See above response.

Responses to Stakeholder Comments and Study Requests – November 2018

Commenter	Topic	Summary of Comments	Responses and Proposed Approach
8/30/2018 Arizona Game & Fish Department (AZGFD)	22	Water analysis request for the Project footprint and surrounding area, for use in determining appropriate placement for a passive water catchment to benefit wildlife.	ITC will develop and implement a 2019 study plan that will use the stated criteria to recommend placement of a catchment.
	23	Surveys for Gunnison Prairie Dog and Black-Footed Ferret	ITC will develop and implement a 2019 study plan to conduct surveys for these species in suitable habitats that are potentially affected by the Project.
	24	Develop a wildlife movement study to "determine how the project actions will impact wildlife movement and potential corridors" including telemetry for pronghorn and mule deer.	ITC will work with AZGFD and other stakeholders to develop a Wildlife Management Plan. The Wildlife Management Plan will include an adaptive management component that will provide for targeted wildlife movement studies if warranted during the course of the Project license.
	25	Habitat suitability surveys to study the best place to restore wildlife habitat, percentage of each species habitat affected and cumulative impacts to habitat.	In consultation with AZGFD and other stakeholders, ITC will develop and implement a 2019 study plan to describe current habitat conditions.