San Joaquin River Flow Modification Project

Draft Environmental Assessment/Initial Study

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Merced Irrigation District

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Background

The project area includes segments of three rivers: the Merced River just below the release site from Lake McClure to its confluence with the San Joaquin River, the segment of the San Joaquin between the Merced River and the Vernalis Gauging Station near the confluence with the Stanislaus River, and that portion of the Stanislaus River from the release site at New Melones Reservoir to its confluence with the San Joaquin River (Figures 1 and 2).

The State Water Resources Control Board (SWRCB or Board) established minimum in-stream flow objectives at Vernalis for the San Joaquin River Basin in the 1995 *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (the "1995 Bay-Delta Plan"). The 1995 Bay-Delta Plan was amended in 2006 (the "2006 Bay-Delta Plan"); however, the Vernalis in-stream flow requirements remained unchanged from the 1995 Bay-Delta Plan. In the 2006 Bay-Delta Plan, the Board established essentially three key flow periods: 1) February through June (commonly referred to as "baseflow" or "shoulder" flows); 2) April – May Spring "pulse" flows; and 3) October Fall "pulse" flows. Both spring and fall pulse flows are intended to protect anadromous fish by providing outmigration and attraction flows. Since egg and larval stages of many fish species occur in the Delta during a relatively short period of time in the spring (April-June), the spring pulse flows also serve to move planktonic eggs and larvae downstream into Suisun Bay where they are less susceptible to entrainment at the State and Federal diversions and at other diversion points within the Delta.

Following the Board's adoption of the Vernalis flow requirements, the Board accepted and adopted the San Joaquin River Agreement (SJRA) in 2000, as part of Decision 1641 (D-1641), as a temporary assignment of responsibility and program of implementation for the Vernalis flow objectives. The SJRA, among other things, was an agreement by the members of the San Joaquin River Group Authority (SJRGA) to make water available for the spring and fall pulse flows, while Reclamation would backstop the February through June base or shoulder flows. The SJRA provided the framework for the Vernalis Adaptive Management Plan (VAMP) experiment, which was designed to determine the biological benefits of the experimental spring and fall pulse flows.

Since the Board adopted the SJRA in 2000, its terms have been fully implemented. However, by its terms, the SJRA expires December 31, 2011. Merced Irrigation District (MID) has and will continue to meet its required fall pulse flow requirements. Reclamation and the SJRGA twice attempted to negotiate an extension of the SJRA flow implementation provisions beyond December 31, 2011, but those negotiations proved unsuccessful (Appendix A).

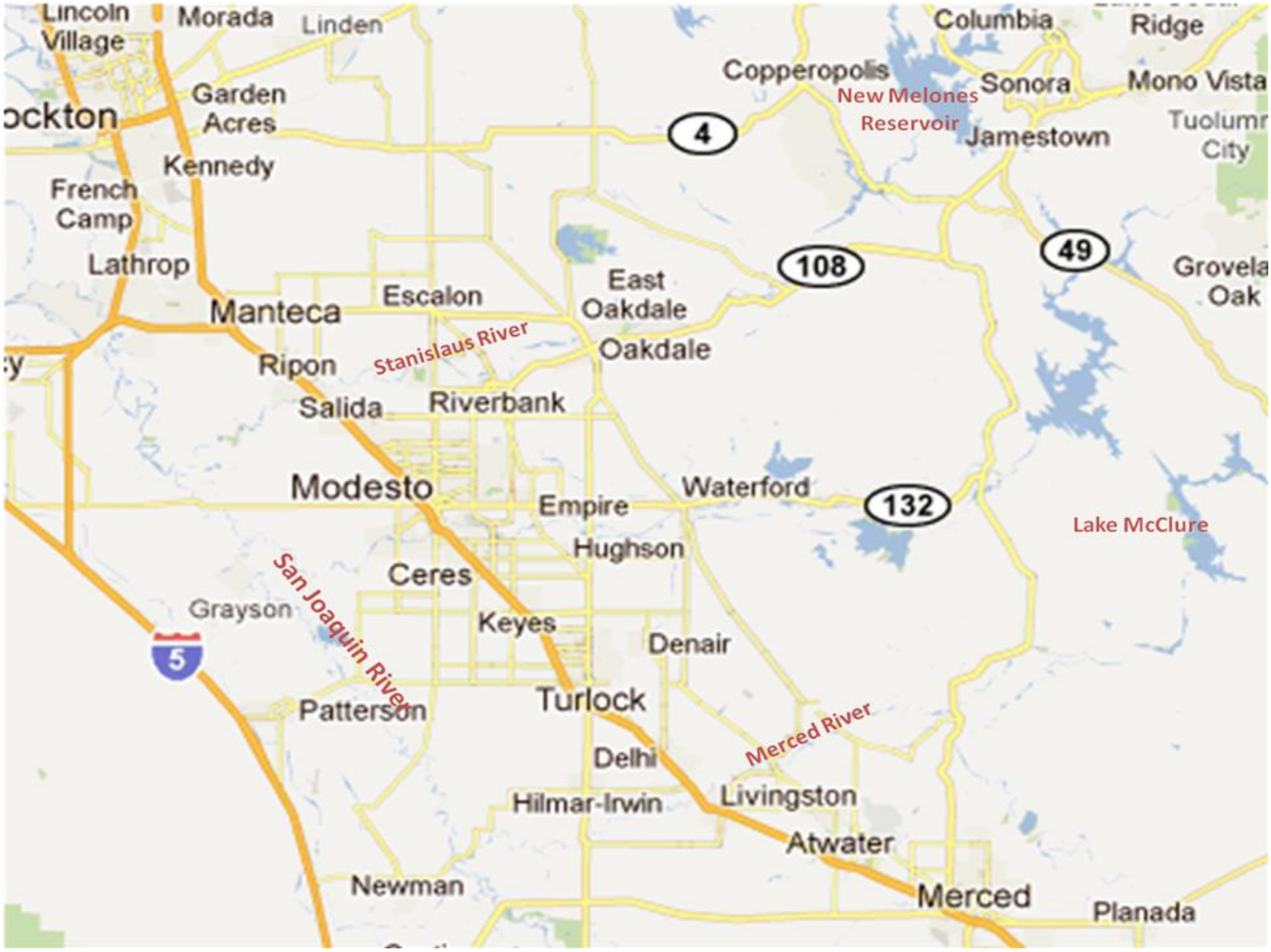

Figure 1. Location Map. New Melones Reservoir, Lake McClure, Merced River, San Joaquin River, and Stanislaus River are labeled in red.

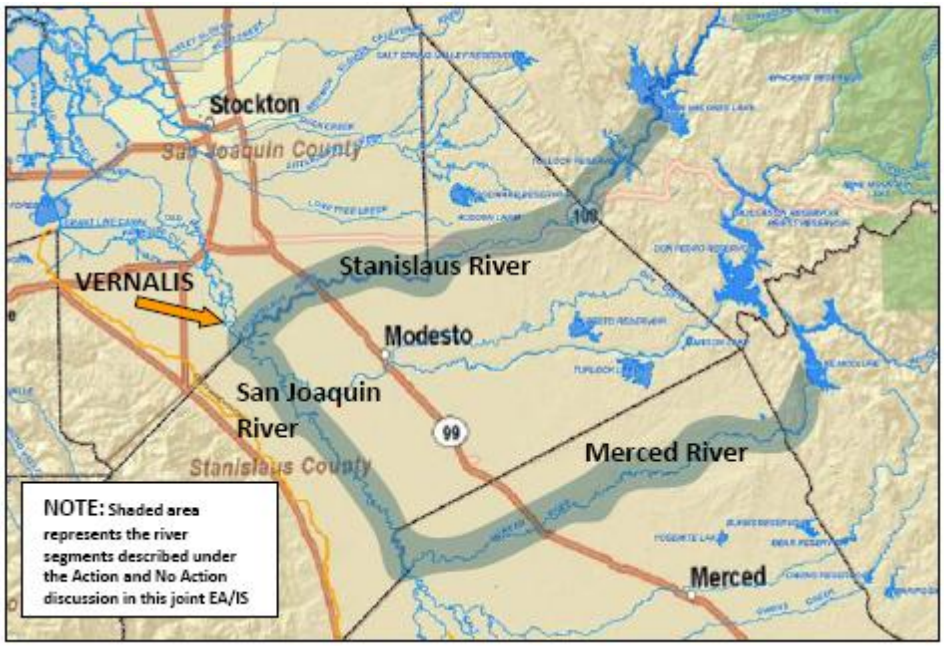

Figure 2. Project Area. The project area includes segments of three rivers: the Merced River just below the release site from Lake McClure to its confluence with the San Joaquin River, the Stanislaus River from the dam at New Melones Reservoir to its confluence with the San Joaquin River, and the segment of the San Joaquin River from its confluences with the Merced River to the Vernalis Gauging Station at its confluence with the Stanislaus River.

Although an extension of the flow provisions from the SJRA could not be agreed upon with the larger SJRGA, Reclamation and MID have successfully negotiated an agreement that will help Reclamation implement spring pulse flow targets similar to those implemented through the SJRA for an additional two years (Appendix B). Per the proposed agreement terms, MID would agree to make certain amounts of water available for the spring pulse flows, with limitations. Unlike SJRA provisions, the MID agreement will not include a "double-step" requirement for flow targets to increase in consecutive wet years.

Need for Proposed Action/Proposed Project [1]

The Board is currently undertaking a review of the San Joaquin River flow objectives originally adopted in the 1995 Bay-Delta Plan. It is considering making significant changes to both the flow objectives and the program of implementation of those objectives. The Board expects to have a new plan for the San Joaquin River flow objectives available for public review by approximately September 2012. Following adoption of a new Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, the Board will then begin its process for implementing the flow objectives.

The purpose of the proposed action is for Reclamation and MID to enter into a two year agreement with each other, establishing a mechanism to assist Reclamation in implementing the

1 The term "Proposed Action" is a NEPA term and "Proposed Project" is a CEQA term. Since this is a joint document, these terms are used interchangeably.

Board's D-1641 flow targets following expiration of the SJRA, and before the Board adopts a new implementation plan for San Joaquin River Basin flow objectives. It would be a "stop gap" measure which provides for spring pulse flows in the San Joaquin River at Vernalis despite the expiration of the SJRA.

Proposed Action

The proposed project is to provide two years of continued implementation of a D-1641 spring pulse flow target for the San Joaquin River at Vernalis. The term of two years was selected by the negotiating parties (Reclamation and MID) as a result of a number of considerations. The proposed project is:

1. Reclamation's payment to MID for the availability to use water from the MID to supplement New Melones Reservoir releases to satisfy a D-1641 31-day spring pulse flow target;
2. To operate New Melones Reservoir in the same manner as it has been historically operated during the SJRA to meet base flow objectives under D-1641 (Feb through April 14 and May 16 through June);
3. To operate the Stanislaus River consistent with the Reasonable and Prudent Alternative (RPA) actions specified by the National Marine Fisheries Service in the 2009 Biological Opinion (BO) on the Coordinated Long-term Operation of the Central Valley Project and State Water Project (2009 BO). Specifically, the Stanislaus River is operated to comply with RPA Action III.1.3. (to maintain suitable steelhead temperatures) and RPA Action III.1.2 (to meet the minimum flows in Appendix 2-E, as measured at Goodwin Dam during spring and fall) These spring releases also help satisfy supplemental pulse flow requirements under a D-1641 Vernalis flow target during the 31-day spring pulse flow period; and,
4. To operate the Jones Pumping Plant in conformance with RPA export limitations under the 2009 BO.

The proposed project is different than the SJRA in the following ways:

1. Does not include the SJRA "double step" component of the spring pulse flow target;
2. Subtraction of Tuolumne River and DMC water contributions to spring pulse flow;
3. Does not address:
   a. Export limitations;
   b. A Head of Old River (HOR) barrier;
   c. Fish monitoring studies.

No Action

The no action alternative is the absence of an agreement for the release of Merced River flows for spring pulse flows at Vernalis. The Stanislaus River (and the CVP) would be operated to the 2009 BO objectives applicable in 2012 and 2013. The Merced River would be operated to meet MID's existing downstream requirements and commitments (i.e., Federal Energy Regulatory Commission, Davis-Grunsky, Cowell Agreement, and fall pulse flows). Reclamation's releases from storage at New Melones Reservoir sufficient to satisfy the 2009 BO requirements (specifically RPA Actions III.1.2 and III.1.3 would contribute to a spring pulse flow at Vernalis.)

Evaluation of Environmental Impacts

To satisfy the need to consider environmental impacts of the Proposed Action pursuant to both NEPA and CEQA, possible effects to resources were analyzed using an initial study checklist adapted from the CEQA Guidelines Appendix G. The factors that were determined to be particularly relevant to the Proposed Action are addressed in more detail following each listed resource.

Resources analyzed

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS. Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. AGRICULTURE AND FORESTRY RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

The Stanislaus River is a large, low gradient, and therefore slow flowing river. The operational releases from New Melones down the Stanislaus River would remain unchanged in all areas. Releases from New Melones to satisfy 2009 BO requirements, which occur both under the No Action and Proposed Action alternatives, would help meet the Vernalis spring target flows between approximately April 15 through May 15 under the Proposed Action. Reclamation's acquisition of water from Merced Irrigation District releases would increase flows in the Merced River by 25,000 AF on average during each 31-day pulse flow period. This would not have a negative overall impact on forestry or agriculture. The water requirements for agriculture and forestry are controlled by, among other things, water rights and local governing entities and would not be impacted by this proposed project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Waters of the U.S.

The term "waters of the U.S." is defined as:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- All interstate waters including wetlands; or
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use or degradation of which could affect interstate or foreign commerce including any such waters.

"Wetlands" are defined as:

> Waters of the U.S. that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands that meet these criteria during only a portion of the growing season are classified as seasonal wetlands.

Special-Status Species

For the purposes of this assessment, "special-status species" are defined as species of management concern to State and Federal resource agencies, and include those species that are:

- Listed as endangered, threatened, or candidate for listing under the Federal Endangered Species Act (ESA);
- Listed as endangered or rare, or proposed for listing, under the California Endangered Species Act (CESA);
- Designated as endangered or rare, pursuant to California Fish and Game Code (Section 1901);
- Designated as fully protected, pursuant to California Fish and Game Code (Section 3511, 4700, or 5050);
- Designated as species of special concern by California Department of Fish and Game (CDFG);

An inventory of regionally occurring special-status plant and animal species was gathered; a complete inventory of special-status species with potential to occur onsite (*i.e.*, Merced River, Stanislaus River, and San Joaquin River from the confluence of the Merced River to the confluence of the Stanislaus River) is provided below. The fish inventory is based on a review of pertinent literature, queries from California Natural Diversity Database (CNDDB), and California Cooperative Anadromous Fish and Habitat Data Program (CalFish).

The list of regionally occurring special-status fish species was evaluated to determine which of the special-status fish species had the potential to occur on the project site. Results from the inventory states that project area supports five special-status fish species. The name and regulatory status these potentially occurring special-status species are identified in Table 1.

Scientific Name	Common Name	State	Federal
Fish Species		Status	
Oncorhynchus tshawytscha	Fall-run Chinook salmon	SSC	SC
Hypomesus transpacificus	Delta Smelt	ST	FT
Acipenser medirostris	Green Sturgeon	SSC	FT
Mylopharodon conocephalus	Hardhead Minnow	SSC	–
Oncorhynchus mykiss	Steelhead	SSC	FT

State CESA Listing Codes		Federal ESA Listing Codes	
ST	State Threatened	FT	Threatened
SSC	California Species of Special Concern - List established by CDFG	SC	Species of Concern - List established by NMFS

Table 1: Potentially occurring special-status fish species in the project area.

Fall-Run Chinook Salmon (*Oncorhynchus tshawytscha*)
Federal Status: Species of Concern – List established by NMFS
State Status: California Species of Special Concern – list established by CDFG

Central Valley fall-run Chinook salmon are philopatric semelparous fish, that is, species staying in or returning to their birthplace and reproducing only once in their lifetime. Fall-run Chinook salmon typically emigrate in the spring of their first year and spend two to four years in the ocean before returning to their natal stream to spawn. The annual fall-run Chinook salmon migration in the Stanislaus River begins in early September, peaks in November, and tapers off in December and early January. Spawning generally occurs shortly after migration, primarily in late October through January. The salmon eggs incubate and hatch in the gravel between October and April, depending on time of spawning and water temperature. The fry begin to emerge from the gravel starting in January and continue through April. Most juvenile Chinook salmon in the Stanislaus River have left the spawning areas by July of their first year. These juveniles move downstream and continue rearing as they pass the vicinity of the Mohler Tract (FWS 2003).

According to the SWRCB and California Environmental Protection Agency 2010 (SWRCB and CEPA 2010), elevated flows during the smolt outmigration period function as an environmental cue to trigger migration, facilitate transport of juveniles downstream, improve migration corridor conditions due to inundated floodplains, reduce predation and improve temperature and other water quality conditions. These factors are all functions that are impaired on the San Joaquin River. Under the 2006 Bay-Delta Plan, elevated flows are limited to approximately the mid-April to mid-May period. However, outmigration timing in the San Joaquin River basin occurs over a prolonged time frame from mid-March through June (CSWRCB and CEPA 2010). This restricted window may impair population viability by limiting survival of fish that migrate outside of this time period, thus reducing the life history diversity and the genetic diversity of the population (CSWRCB and CEPA 2010). Diverse migration timing increases population viability by making it more likely that at least some portion of the population is exposed to favorable ecological conditions in the Delta and into the ocean (CSWRCB and CEPA 2010). Temperature conditions in the San Joaquin River basin may limit smolt outmigration and survival. Lethal

temperature thresholds for Pacific salmon depend, to some extent, on acclimation temperatures (CSWRCB and CEPA 2010). Central Valley salmonids are generally temperature-stressed through at least some portion of their freshwater life-cycle (CSWRCB and CEPA 2010). Lethal temperature effects commence in a range between 71.6° and 75.2° F (CSWRCB and CEPA 2010). The Proposed Action of continuing the implementation of the D-1641 spring pulse flow targets is likely to benefit these species. Therefore, fall-run Chinook salmon are not likely to be adversely impacted by the proposed project.

Delta Smelt (*Hypomesus transpacificus*)
Federal Status: Threatened
State Status: Threatened

Delta smelt are endemic to in the Sacramento-San Joaquin Estuary from Suisun Bay though the delta. The majority of their life span occurs within the interface of saltwater and freshwater (Moyle 2002). Delta smelt are euryhaline species that can survive in freshwater and estuarine waters reaching approximately 14 parts per thousand. Adults can reach 5 to 7.5 cm standard length and migrate upstream from the estuarine waters associated with the mixing zone and disperse widely into river channels and tidally influenced backwater sloughs to stage shortly before spawning (FWS 2007). Delta smelt spawn in shallow, fresh, or slightly brackish water upstream of the mixing zone. Although spawning has not been observed in the wild, eggs are thought to attach to substrates in tidal marshes such as cattails, tules, tree roots, and other submerged branches (FWS 2007). The project area is not within critical habitat for Delta smelt. Delta smelt are not likely to be adversely impacted by the proposed project.

Green Sturgeon (*Acipenser medirostris*)
Federal Status: Threatened- List established by NMFS
State Status: California Species of Special Concern - List established by CDFG

Green sturgeon are found in the lower reaches of large rivers from British Columbia south to the Sacramento River. In the Central Valley, spawning habitat may have extended to Butte Creek watershed. Currently, spawning occurs in the mainstem Sacramento River and some spawning may occasionally take place in the Feather River. Green sturgeon are anadromous species migrating from the ocean to their natal freshwater streams as adults between March and July to spawn when river temperatures are within 45°F and 57°F. Females are broadcast spawners that produce 60,000–140,000 eggs in swift water and then fertilized externally. Eggs hatch in about eight days at 55°F. Juveniles generally migrate downstream in spring or fall between one and three years of age. They remain close to estuary before migrating long distances as they grow and mature. Mature fish are typically 15 to 20 years old. Environmental factors most likely to reduce survival and production of green sturgeon are low flows, high water temperatures, water quality, barriers to fish passage, water diversions and exports, competition with nonnative species, and incidental take from sportfishing. The project area is not within the critical habitat for green sturgeon. Green sturgeon are not likely to be adversely impacted by the Proposed Action.

Hardhead Minnow (*Mylopharodon conocephalus*)
Federal Status: –
State Status: California Species of Special Concern - List established by CDFG

Hardhead are widely distributed in low- to mid-elevation streams in the main Sacramento-San Joaquin Basin. In the San Joaquin Basin, the species is scattered in tributary streams and absent from valley reaches of the San Joaquin River. Most streams in which they occur have summer temperatures in excess of 68°F, while optimal temperatures appear to be 75°F –82°F. At higher temperatures, hardhead become intolerant of low dissolved oxygen levels, a factor that may limit their distribution to well oxygenated streams and to surface water of reservoirs. Hardhead prefer clear, deep pools and runs with sand-gravel-boulder substrates and slow velocities. Adults prefer to remain in the lower half of the water column. Hardhead tend to be absent from streams that have been severely altered by human activity, although they can persist below dams under certain conditions. They have a relatively poor swimming ability at low temperatures may keep them from moving upstream with natural or human made velocity barriers.

Steelhead (*Oncorhynchus mykiss*)
Federal Status: Threatened
State Status: Threatened

Steelhead are the anadromous form of *O. mykiss*. This anadromous fish is a Distinct Population Segment (DPS) listed under the federal Endangered Species Act by the National Marine Fisheries Service (NMFS 1988 and Federal Register 2006). Although populations are not well known in the Central Valley (CV) streams, Zimmermann *et al.* (2009) found steelhead progeny in some rivers of the San Joaquin River Basin (Martin 2011). Adult steelhead typically migrate upstream and spawn during the winter months when river flows are high and water clarity is low (The Nature Conservancy 2008). Critical habitat for CV steelhead include riverine habitats in the San Joaquin River Basin (NOAA 2005).

Steelhead have the greatest diversity of life history patterns of any Pacific salmonid species, including varying degrees of anadromy, differences in reproductive biology, and plasticity of life history between generations. They prefer cold water between 55°F and 70°F that is saturated with dissolved oxygen. In the Stanislaus River, CV steelhead exhibit two forms, a resident form that may remain in the river its entire life and an anadromous form that emigrates to the ocean and returns to its natal stream to spawn. Most river resident CV steelhead mature in two to three years. Most anadromous forms first spawn after spending two to three years in freshwater and then one to two years in the ocean. Both resident and anadromous forms may be produced in the same redd, and anadromous forms are known to spawn with residents. CV steelhead undergo greater summertime growth during the juvenile physiological transformation (*i.e.*, smoltification) necessary for successful ocean migration compared to the nonanadromous form (Beakes *et al.* 2010). In addition, winter and spring flows are hypothesized to be important cues related to emigration of juvenile steelhead. As returning adults, spawning occurs in the spring, but the spawning migration of anadromous forms extends from summer until the following spring. Females excavate a redd in gravel-bottomed riffles and select a mate. The eggs are buried in the redd after spawning. They hatch in 3 to 4 weeks and the alevin emerge from the gravel as fry within two to three weeks and begin feeding. Unlike other salmonids which can only spawn once

before death, a percentage of steelhead population can return to the ocean and migrate back upstream to spawn in subsequent years. The proposed project of continuing the implementation of the D-1641 spring pulse flow targets is likely to benefit these species. Therefore, CV steelhead are not likely to be adversely impacted by the Proposed Action.

Discussion and Findings

No Action Alternative

Indirect impacts from reduced flows into the Sacramento-San Joaquin Delta that could be realized under the No Action Alternative may potentially have a negative impact to the fall-run Chinook salmon, CV steelhead, and green sturgeon. Spring Pulse Flow Objectives at Vernalis are not likely to be reached. This may disrupt emigrating fall-run Chinook salmon and prevent CV steelhead from expressing their life history strategies. Flow is one of the limiting factors in steelhead recovery in the San Joaquin River. Decreased freshwater inflow affects the survival, abundance, migration, and rearing of Chinook salmon in the upstream (Delta) portions of the Sacramento-San Joaquin Estuary (Kjelson *et al.* 1981). Therefore, additional inflows of freshwater at the appropriate time during the winter and spring are likely to increase the numbers of fry and rearing juvenile salmon due to increased habitat availability if floodplains are inundated. Chinook salmon smolt survival will likely decrease as flow rates decrease particularly in the later portions of the emigration periods (Kjelson *et al.* 1982). In addition to flows affecting survival of both fall-run Chinook salmon and steelhead, maintaining appropriate water temperatures in the tributaries is also a high priority in order to increase the likeliness of completing their life history strategies. Increased water temperature due to low flows is a potential limiting factor for fish survival; flows play a substantial role in maintaining suitable water temperatures within the river system. Higher flows prolong and extend cool water migratory corridor. Reduced flows may lead to declines in the suitability of the riverine habitats for steelhead, increased intra- and interspecies competition for resources and space in the remaining cold water reaches, and a diminishment in the opportunity to emigrate successfully from these basins in the spring. This may cause individual steelhead to be prevented from emigrating to the estuarine habitat. Under the No Action alternative, the fish species discussed above may be significantly impacted if the direct relationship between variable biological requirements and habitat conditions for a given life stage are not met. The No Action alternative may ultimately affect habitat conditions which in turn may significantly harm the species current condition, future health, and viability. The definition of "take" under section 3(18) of the Endangered Species Act (ESA) is to harass, harm, pursue, hunt, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct with respect to ESA listed species. The No Action alternative may result in a negligible probability of "take" for green sturgeon and steelhead by hindering the attainment of relevant functioning indicators (*i.e.*, water quality, habitat access, habitat elements, channel conditions ans dynamics, flow/hydrology, and watershed conditions) as defined in Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale (NMFS 1996). However, it is difficult to quantify the level and extent of "take" without addressing fish monitoring studies.

Proposed Action Alternative

The voluntary two-year agreement between Reclamation and MID to release Supplemental Water from the Merced River is needed to provide a mechanism to maintain the implementation of a 1995 WQCP 31-day Spring Pulse Flow Objective on the lower San Joaquin River at Vernalis. Deficiencies in flows will be calculated to be the difference between the sum of the forecasted base flows at Vernalis during the Pulse Flow Period and the incremental releases from New Melones Reservoir to satisfy RPA actions under the 2009 BO and the Vernalis Spring Flow Target.

After reviewing life history strategies and presence and absence of special-status fish species within the project area during pulse flow period, the impacts of the proposed project to the biological resources are not expected to have a significant adverse effect on any species listed on Table 1. In fact, the Agreement is intended to, and will likely aid in the survival of the above listed fish species for the reasons discussed above.

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	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

A Reclamation archaeologist was consulted to ensure the Proposed Action would have no adverse impact on any historic properties. It was determined that this type of activity does not have the potential to cause effects on historic properties, if present, pursuant to 36 CFR Part 800.3(a)(1) and the archaeologist's review concluded compliance with Section 106 of the National Historic Preservation Act. See (Appendix C) for written response from archaeologist dated November 4, 2011.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GREENHOUSE GAS EMISSIONS. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Hydrology Model Discussion:

Hydrology Model: Reclamation developed a model to evaluate alternatives for meeting a spring pulse flow standard on the San Joaquin River at Vernalis. The model is a modified version of the CalSim 2 model, which was customized to allow for greater flexibility in analyzing different possible pulse flow standards and reservoir release responsibilities. Unlike the full CalSim 2 model, which simulates the Sacramento and San Joaquin Basins and the Delta, the model used here only covers the San Joaquin Basin upstream of Vernalis. The model was run using "Existing Level of Development" assumptions.

Study Description: Model simulations were conducted to analyze the No Action Alternative and the Proposed Action Alternative using a technique called "Position Analysis". Here, initial conditions in the model were set to correspond to actual conditions in September 2011, and then an analysis was performed to simulate the following two years using 80 different two year periods of historical hydrology as inputs. This was done to simulate the range of conditions that could occur during a two year agreement for 2012-2013. The 80 two-year periods were drawn from all possible consecutive pairs of years from 1922 to 2002, i.e. 1922-23, 1923-24, 1924-25 etc. Model runs were conducted using the standard CalSim 2 water year (Oct-Sept) and input hydrology for each year was identical to that used in the CalSim 2 model. The initial conditions consisted of actual reservoir storages in September 2011. Minimum instream flow patterns and water delivery schedules early in the first water year of each simulation were fixed to patterns that would typically occur following a "Wet" water year. Model results show the expected range of hydrologic conditions that could occur during the two-year agreement period.

Model outputs analyzed: The following model outputs were analyzed:

- Incremental releases in each year to meet a D-1641-like Vernalis Flow Target which does not include the double step, as mentioned above
- Flows at Vernalis and on the Stanislaus and Merced Rivers
- New Melones and Lake McClure storage patterns

Model assumptions: The only assumption that differs between the No Action Alternative and the Proposed Action is the single-step VAMP target flow standard at Vernalis and how it is met. The No Action Alternative has no single-step spring flow target. The Proposed Action includes a D-1641 target flow that includes the same single-step VAMP spring flow standard, as in the SJRA, with incremental releases to meet the standard coming from MID (i.e. Lake McClure). Releases from New Melones to meet the 2009 BO requirements also help meet this flow standard at Vernalis. The single-step standard comprises the same existing flows and target flows as described under VAMP in D-1641 and the San Joaquin River Agreement, as follows (Table 2):

Existing Flow (cfs)	Target Flow (cfs)
0-1,999	2,000
2,000-3,199	3,200
3,200-4,449	4,450
4,450-5,699	5,700
5,700-6,999	7,000
7,000 or greater	Existing Flow

Table 2: VAMP single-step spring flow target per D-1641.

In the model, existing flow (cfs) includes releases to meet all existing minimum flow requirements (except the Stanislaus RPA), water quality releases, spills, and interim San Joaquin River Restoration Program instream flows. Once existing flow is established, additional spring releases are made from Lake McClure to assist Reclamation in meeting the corresponding target flow. Additional releases needed to meet the Stanislaus RPA are not counted in existing flow, but can help meet the target flow prior to releases from Lake McClure (refer to Graph 1 for a comparison of the magnitude of releases from the Merced and the Stanislaus Rivers to meet the VAMP single-step target). The VAMP provision for relaxation of the target flow to existing flow after three consecutive Critical water years (or two Critical and one Dry) was not needed in the model because the two water-year types prior to 2012-2013 were "wet" (2011) and "above normal" (2010), making it impossible for such relaxation to occur in the period being modeled. Please also refer to the California Data Exchange Center (CDEC) website which shows the water year types at http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST.

All other model assumptions are identical in both alternatives. Key assumptions are listed below. Other assumptions not listed here are identical to CalSim 2 model assumptions used in Bay-Delta Conservation Plan (BDCP) modeling.

- San Joaquin River at Vernalis:
    - SWRCB D-1641 minimum flow standards February through June (except April 15 – May 15 pulse period), met with releases from New Melones.
    - SWRCB D-1641 salinity standards met with releases from New Melones.
    - No incremental releases are made from New Melones pursuant to RPA Action IV.2.1.

Phase II of RPA Action IV.2.1 is predicated upon Reclamation and DWR being able to contract with willing sellers to meet the Vernalis flow standard in the BO. Reclamation twice attempted to negotiate with the SJRGA to extend the period of flows agreed upon in the SJRA, but ultimately those negotiations proved unsuccessful (Appendix A). Thereafter, Reclamation successfully negotiated a draft contract with MID staff resulting in an approved resolution to contract with Reclamation by the MID Board at their November meeting (Appendix B). Reclamation believes that the flows resulting from Stanislaus River operations pursuant to the

BO plus the flows Reclamation purchases from MID will constitute VAMP-like flows and are consistent with the requirements of RPA Action IV.2.1.

- Stanislaus River:
    - Reclamation intends to continue to implement the Goodwin flow schedule for the Stanislaus River as prescribed in the 2009 BO RPA Action III.1.3 under both the No Action and Proposed Action Alternatives. Table 3 shows how the annual allocation is the same as that in the 2009 NMFS BO, using the New Melones Index breakdown from the Interim Plan of Operations (IPO):

New Melones Index (IPO water supply categories, taf)	Stanislaus RPA annual allocation (taf)
0-1,400	185.3
1,400-2,000	234.1
2,000-2,500	346.7
2,500-3,000	483.7
3,000-6,000	589.5

Table 3. New Melones Index breakdown from the IPO.

    - Stockton East delivery schedule is modeled as follows: 155 taf when the New Melones Index (NMI) > 2500, 0 taf when NMI < 2000, and linearly interpolated between 0 and 155 when NMI is between 2000 and 2500. In actual operations, Reclamation will make every attempt to make full contractual deliveries to the CVP contractors except when prevented from doing so due to drought conditions.
    - No 1500 cfs flow cap at Goodwin. This flow cap has been in earlier CalSim 2 models, but is removed here since it can conflict with flows needed to meet the Stanislaus RPA. In actual operations, Reclamation will weigh potential impacts to land owners before exceeding the 1500 cfs flow limitation
    - SWRCB D-1422 standards for dissolved oxygen in June-September are met with releases from New Melones.
    - Stanislaus RPA NMFS Action III.1.2 (Temperature Standard) will be met under both the No Action and Proposed Action Alternatives; however, compliance with this standard is not explicitly modeled.

- Tuolumne River:
    - Minimum flow requirements under FERC 2299-024 (1995 Settlement Agreement) are met with releases from New Don Pedro Dam.

- Merced River:
    - Minimum flow requirements under FERC 2179, Davis-Grunsky Agreement (November - March), and Cowell Agreement are met with releases from Lake McClure.

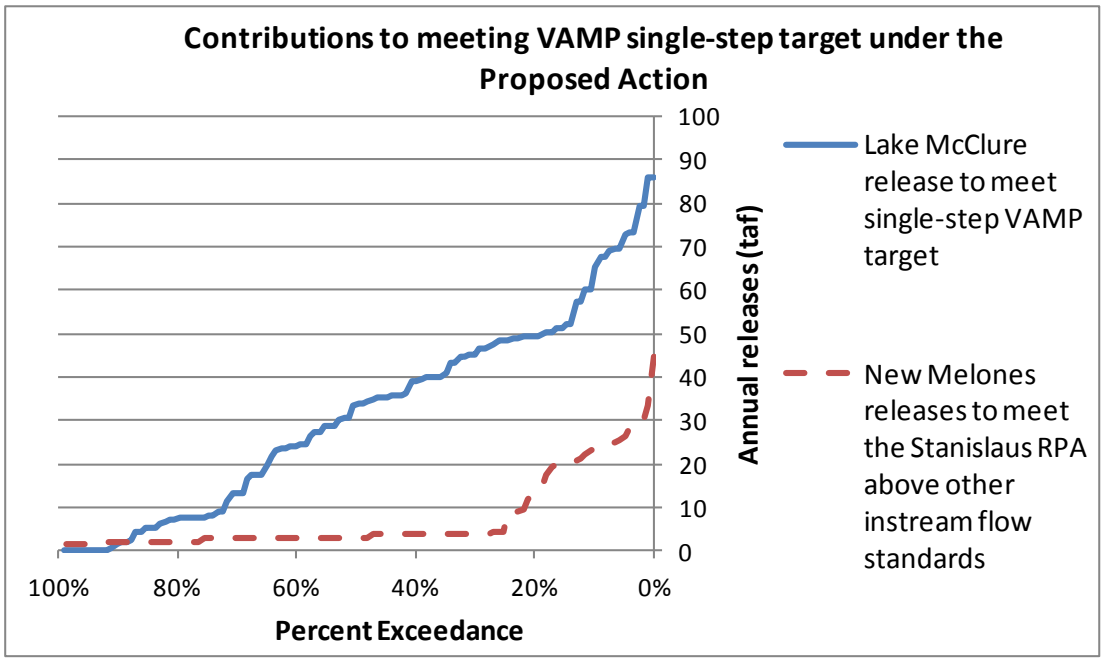
- Merced ID makes a 12.5 taf release in October as per Memorandum of Understanding with the California Department of Fish and Game signed in August 2001 (see Appendix D).

- Upper San Joaquin River:
  - Releases are made from Friant Dam according to the Interim Flow release schedule of Reclamation's San Joaquin River Restoration Program.
  - Loss assumptions: 50% of restoration flows are assumed to make it to the junction with the Merced River during February - May, and 10% make it in June. Loss assumptions during other months are the same as in CalSim 2. These loss assumptions will dominate during dry and normal years, while in wetter years contributions from the Upper San Joaquin River will be higher due to flood flows.

The Proposed Action would comply with the export ratio, which is part of the 2009 BO RPA IV.2.1, though that is external to the model since it occurs in the Delta downstream of Vernalis.

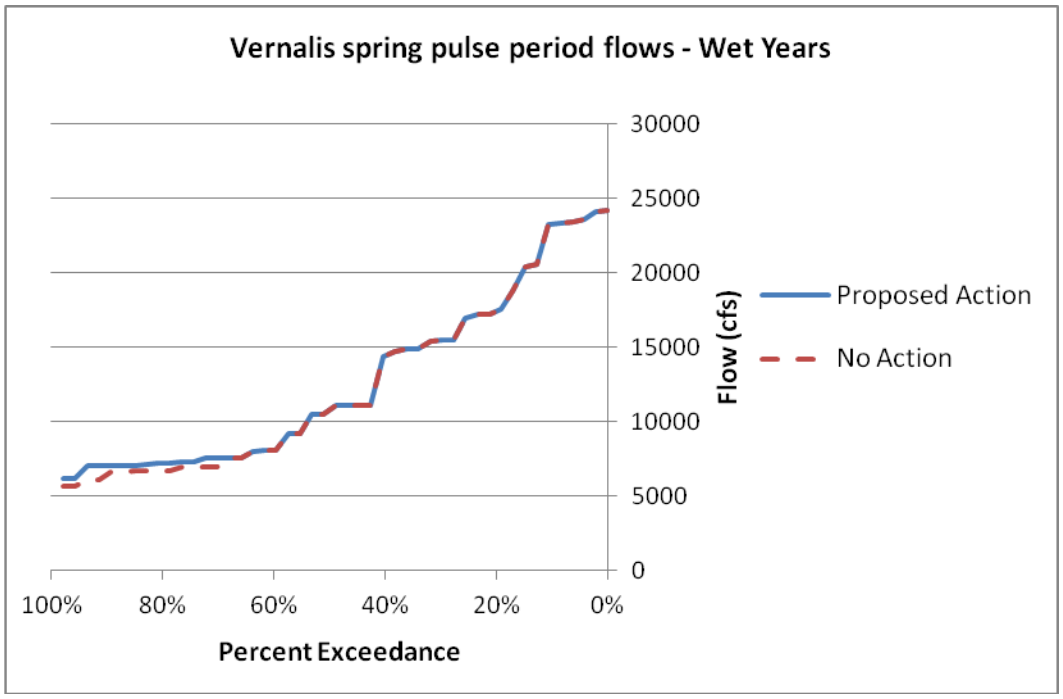
No double-step requirement is modeled in the Proposed Action Alternative. Under the SJRA, the double-step requirement would have been triggered by two consecutive wet years or a wet year and an "above normal" water year. If the double-step were triggered, it would account for between 1200 – 1300 cfs of additional water being released to meet D-1641 target flows at Vernalis. Reclamation was unsuccessful in negotiating renewal of the SJRA where this double-step target flow was included (see Appendix A).

To see how the Proposed Action will affect hydrology, please refer to the following graphs. All the graphs are percent exceedance graphs which show the percent of years simulated in the model runs when the flow or storage value on the y-axis is equalled or exceeded.



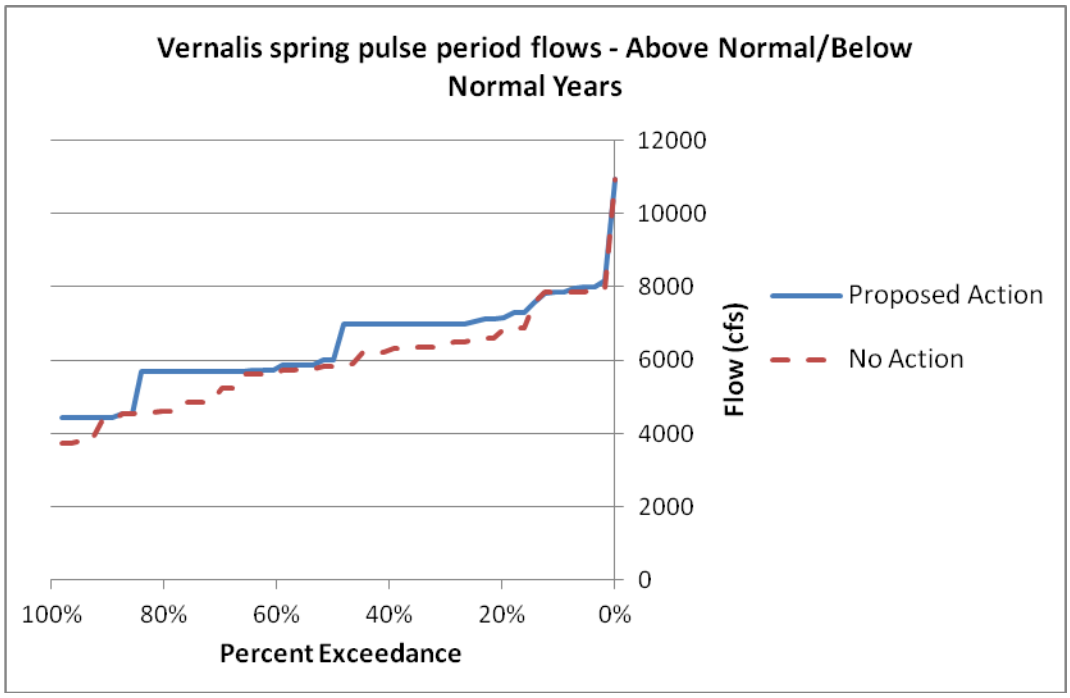
Graph 1. Hydrology Model Results for Releases to Meet the VAMP Single-Step Target Under the Proposed Action.

This graph compares annual releases under the Proposed Action from Lake McClure and New Melones that contribute to meeting the VAMP single-step target during the spring pulse period (15 April - 15 May), as estimated for 2012-2013. Lake McClure releases are those made under the proposed Reclamation-MID agreement (Appendix B). New Melones releases are those that meet the Stanislaus RPA (Action III.1.3) in excess of other instream flow standards on the Stanislaus, since flows to meet standards other than the RPA are already in the VAMP baseline. Releases are shown here for all simulated years where additional releases contributed to meeting the VAMP single-step target (i.e. when the VAMP baseline flow was < 7000 cfs). The percent exceedance curve for Lake McClure contributions is substantially higher than the percent exceedance curve for New Melones contributions more than 80% of the time under the Proposed Action.



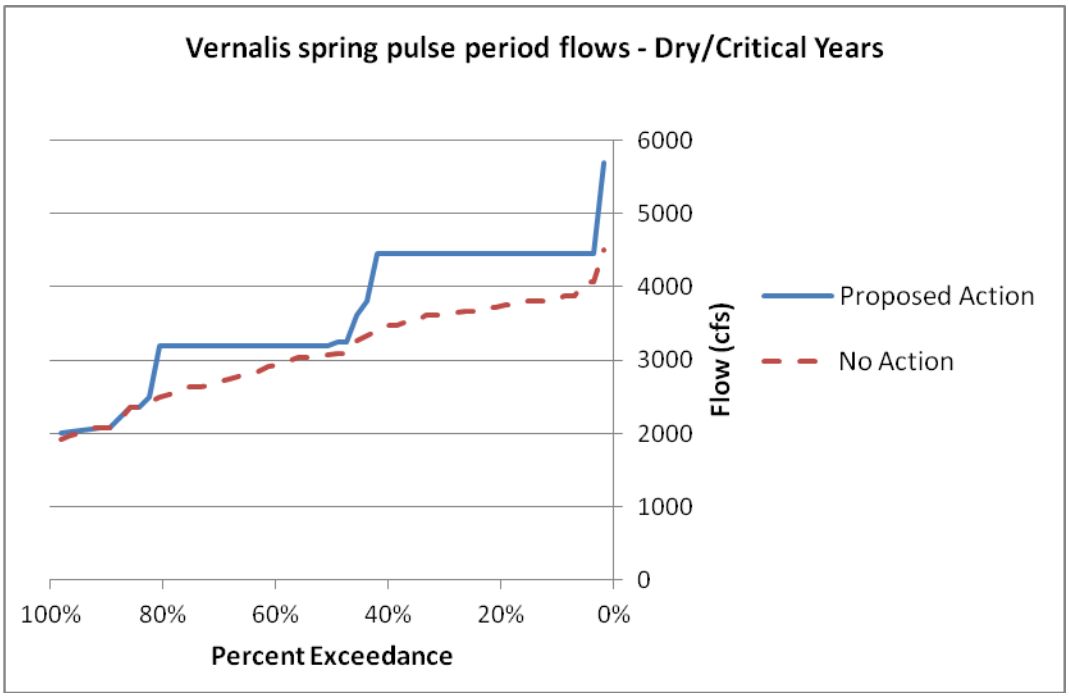
Graph 2. Hydrology Model Results for Vernalis Spring Pulse Period Flows in wet years.

This graph shows the expected exceedances for flow at Vernalis during "wet" years, for the spring pulse flow period (15 April - 15 May) as estimated for 2012-2013. When comparing the Proposed Action to the No Action, one can see how the exceedance curve for river flows (cfs) is higher under the Proposed Action during the spring pulse flow period nearly 35% of the time. The curves are the same for the No Action and the Proposed Action the rest of the time in "wet" years.



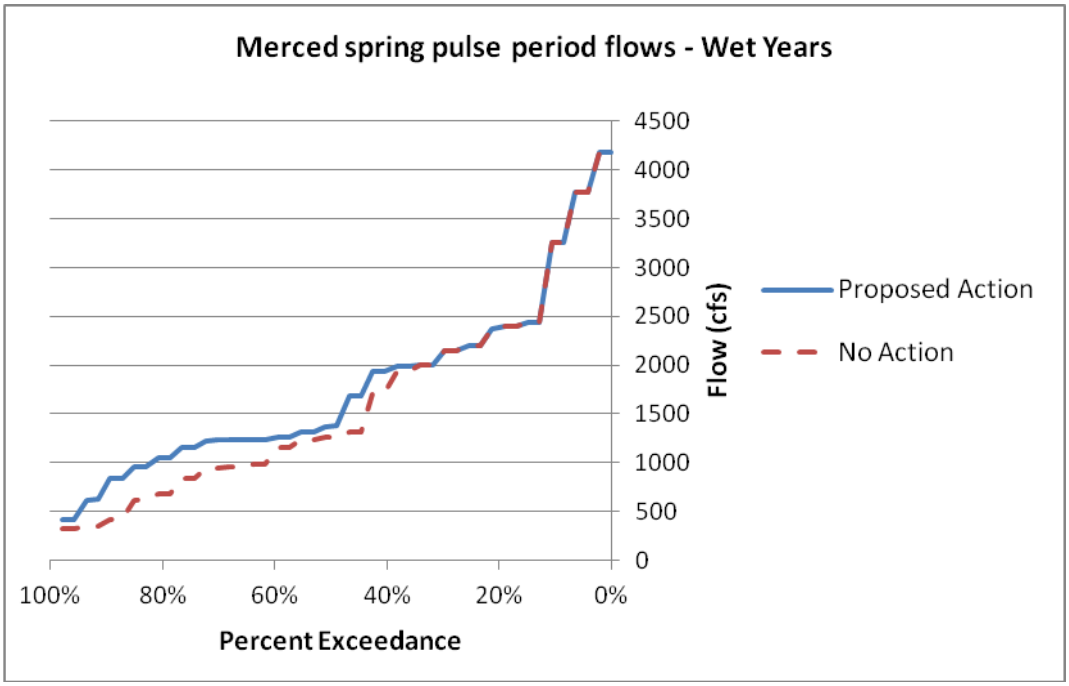
Graph 3. Hydrology Model Results for Vernalis Spring Pulse Period Flows for Above Normal/Below Normal years.

In "above normal" and " below normal" years during the spring pulse flow period (15 April – 15 May) the expected exceedance curve for flows at Vernalis is higher more than 80% of the time under the Proposed Action for 2012-2013 when compared to the No Action. Water would be supplied at Vernalis by supplemental water from the Merced River in the Proposed Action. The No Action entails no additional releases other than those pursuant to RPA Action III.1.3 under the 2009 BO for spring pulse flows at Vernalis.



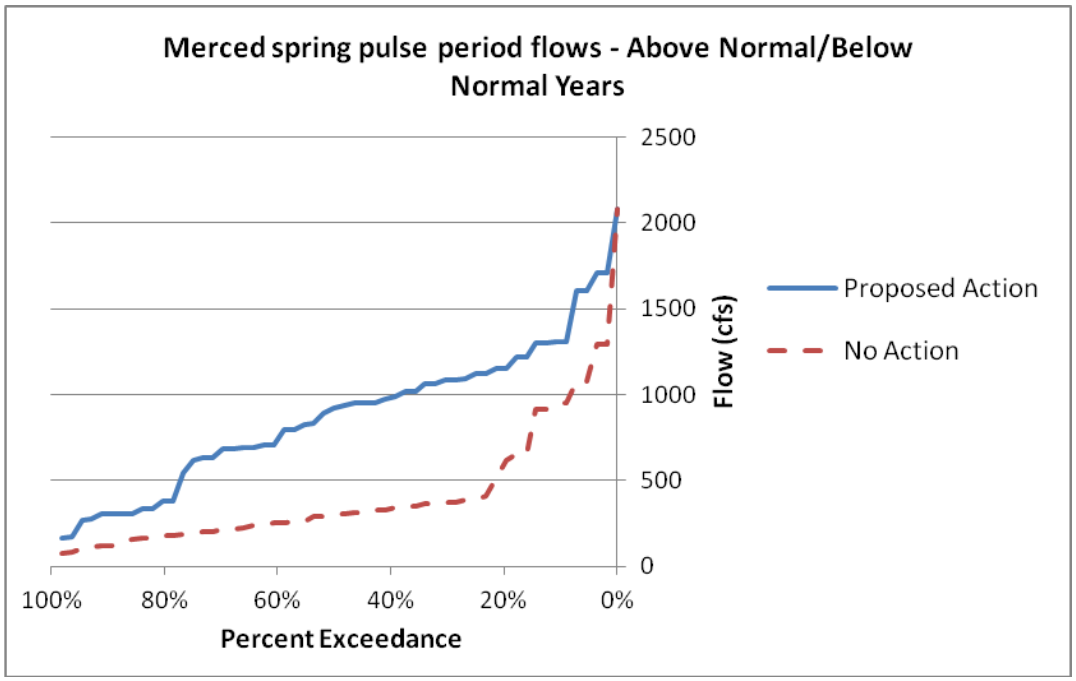
Graph 4. Hydrology Model Results for Vernalis Spring Pulse Period Flows for Dry/Critical years.

This graph shows the expected exceedances for flow at Vernalis during "dry" and "critical years" for the spring pulse flow period (15 April - 15 May). The exceedance curve for river flows (cfs) is higher approximately 90% of the time under the Proposed Action compared to the No Action, as estimated for 2012-2013. The graph shows that during approximately 20% of years Vernalis flow is above 2000 cfs in the Proposed Action but is not increased to a VAMP target of 3200 cfs. This occurs in years when the existing flows used to set the VAMP target are less than 2000 cfs (so the VAMP target is 2000 cfs), but then releases to meet the Stanislaus flow RPA are enough to meet the target without any additional release from Lake McClure.



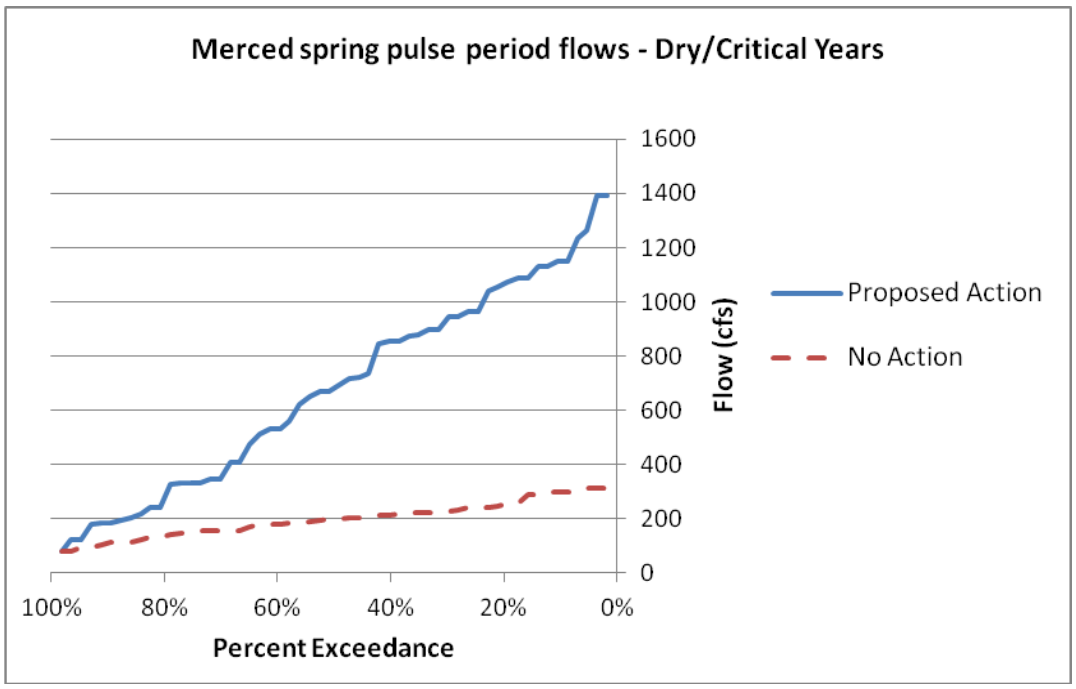
Graph 5. Hydrology Model Results for Merced River Flows During Spring Pulse Period in Wet Years.

When compared to the No Action, the exceedance curve for river flows during "wet" years is higher more than 60% of the time under the Proposed Action due to water being released for the spring pulse flow period (15 April – 15 May) from the Merced River. The No Action results in base flows down the Merced River, but does not result in incremental releases for the spring pulse flow.



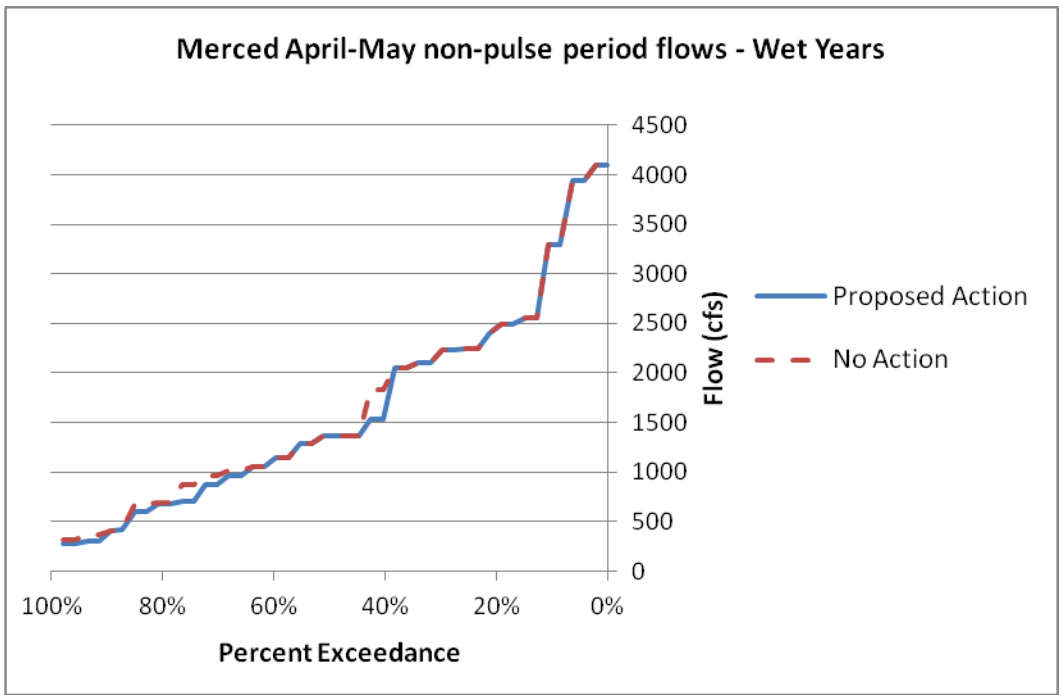
Graph 6. Hydrology Model Results for Merced River Flows During Spring Pulse Period in Above Normal/Below Normal Years.

The expected exceedance graph above illustrates model predictions on the Merced River during "above normal" and "below normal" years. The model predicts that the exceedance curve for river flows will be higher under the Proposed Action as compared to the No Action almost 100% of the time during the spring pulse flow period (15 April – 15 May) for 2012-2013. This is because flows would be supplied by Lake McClure. The No Action results represent flows from Lake McClure to meet only MID's existing downstream requirements.



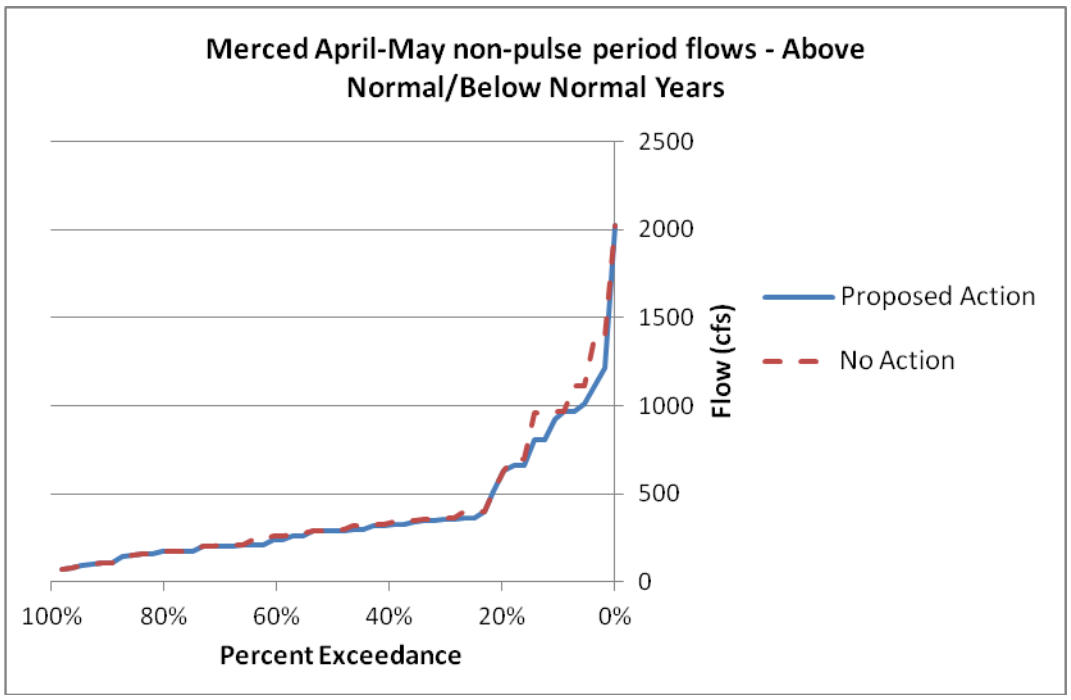
Graph 7. Hydrology Model Results for Merced River Flows During Spring Pulse Period in Dry/Critical Years.

During "dry" and "critical" years, the hydrology model shows that water would be released from Lake McClure for the spring pulse flow period (15 April – 15 May) for the Proposed Action. Water from Lake McClure for spring pulse flows would not be released down the Merced River for the No Action, causing the exceedance curve to be lower nearly 100% of the time during the spring pulse period as compared to the Proposed Action.



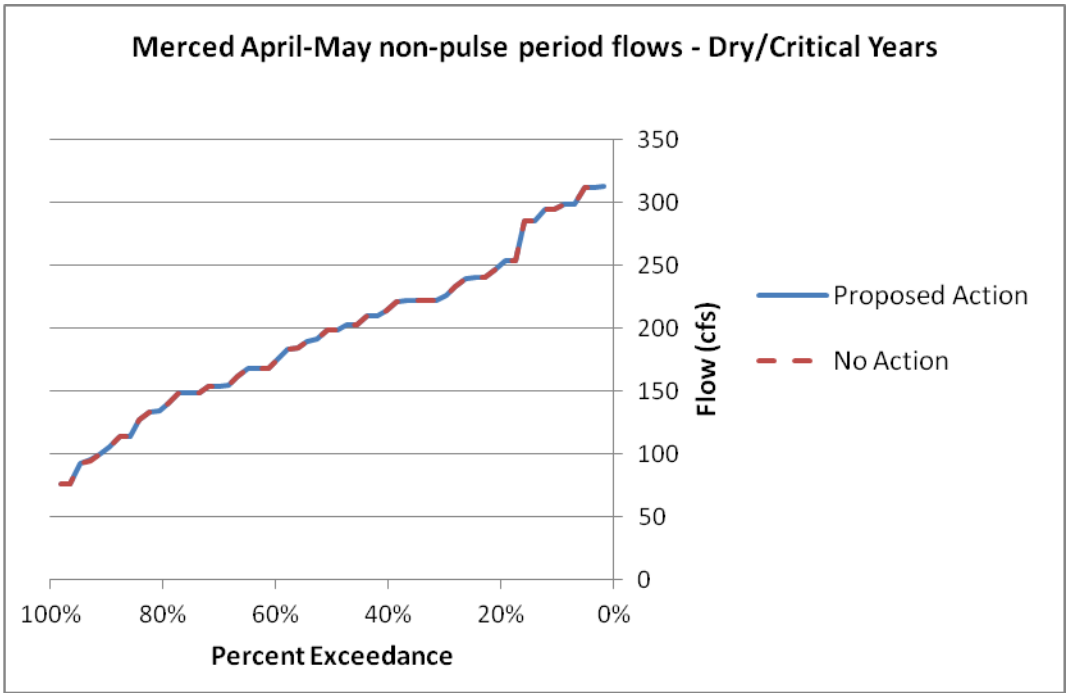
Graph 8. Hydrology Model Results for Merced River Flows During the Non-Pulse Portions of April and May for Wet Years.

The above graph depicts the expected exceedances for the Merced River flows for "wet" years, during the non-pulse time period (1-14 April and 16-31 May) estimated for 2012-2013. The No Action sometimes has more water (cfs) travelling down the Merced River during this period because of more frequent spills from Lake McClure. Spills are less frequent in the Proposed Action because more water is being released for the spring pulse flows, hence lowering storage levels in Lake McClure.



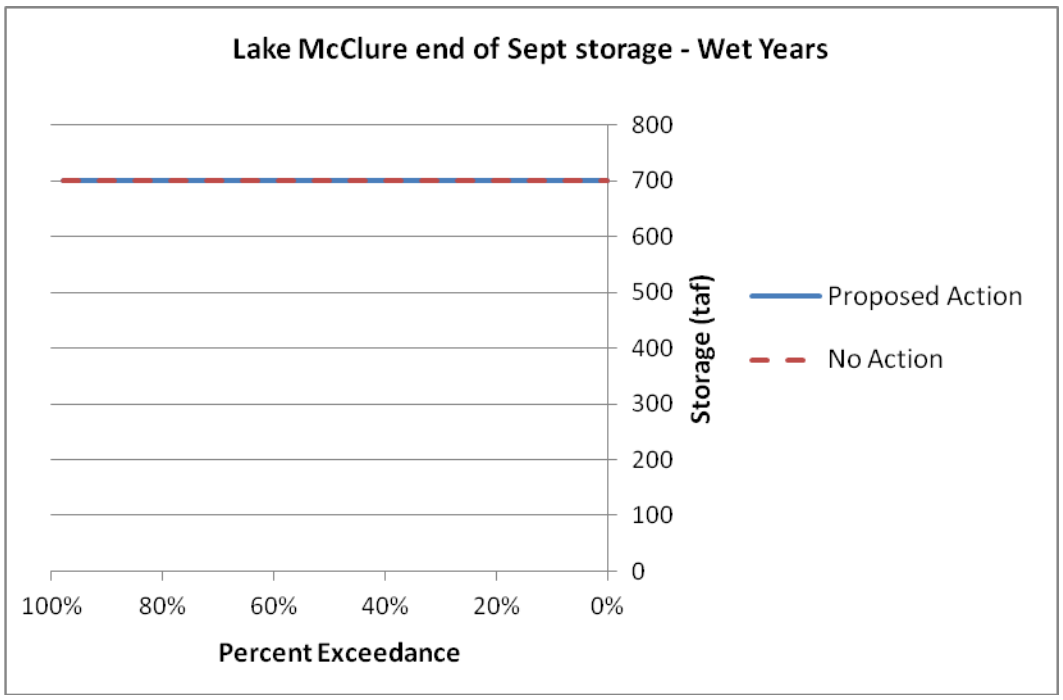
Graph 9. Hydrology Model Results for Merced River Flows During the Non-Pulse Portions for Above Normal/Below Normal Years.

During "above normal" and "below normal" years for the non-pulse period flows (1-14 Apr and 16 -31 May) the graph depicts slightly reduced water flows for the Proposed Action because water would be released from Lake McClure down the Merced River for the spring pulse flow period (15 Apr – 15 May). Spills are less frequent in the Proposed Action because more water is being released for the spring pulse flows, hence lowering storage in Lake McClure. The No Action sometimes has more water (cfs) travelling down the Merced River during the non-pulse period because of more frequent spills from Lake McClure.



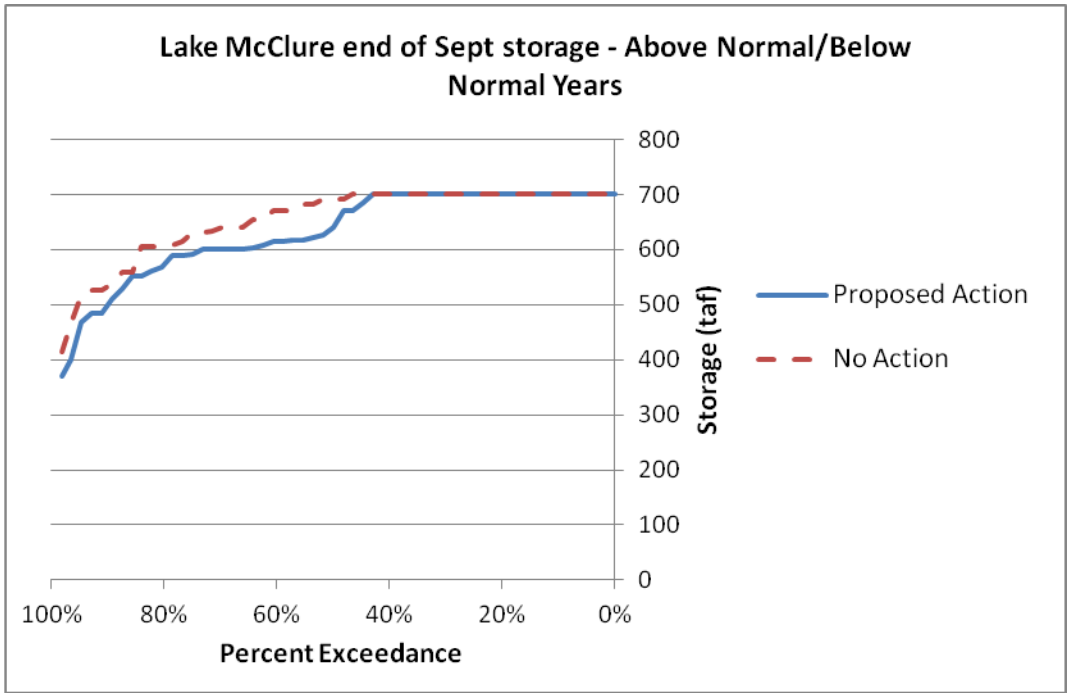
Graph 10. Hydrology Model Results for Merced River Flows During the Non-Pulse Portions for Dry/Critical Years.

This graph shows the expected exceedances for Merced River flow during dry / critical years, during the non-pulse time period (1-14 Apr and 16-31 May) as estimated for the next two years. There is no difference here between river flows in the No Action and the Proposed Action, because during "dry" and "critical" years reservoir storage is low enough that spills are minimal, unlike in the other water year types.



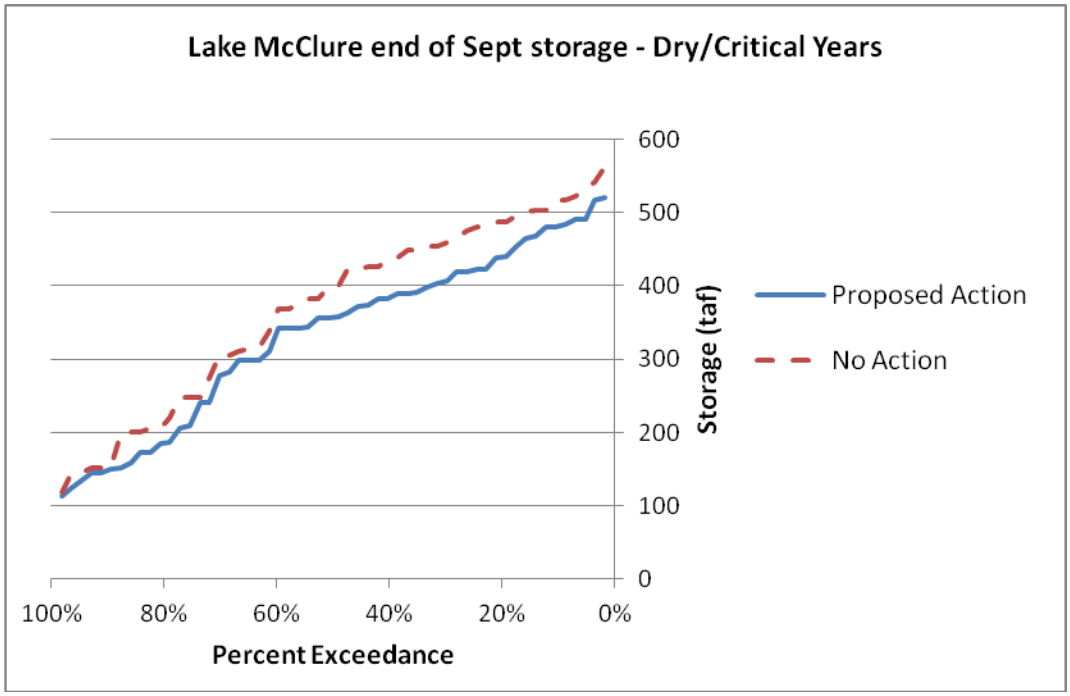
Graph 11. Hydrology Model Results for Lake McClure Storage (Merced River) for Wet Years.

This graph shows the expected exceedances for end of September storage in Lake McClure during wet years, as estimated for the next two years. Comparing the Proposed Action to the No Action, water storage (taf) is identical at the CalSim guide curve level of 700 taf.



Graph 12. Hydrology Model Results for Lake McClure Storage (Merced River) for Above Normal/Below Normal Years.

The graph above shows end of September storage for 2012-2013 during "above normal" and "below normal" years. The exceedance curve for storage (taf) under the Proposed Action is slightly lower almost 60% of the time as compared to the No Action, as water would be released from Lake McClure for the spring pulse flow (15 Apr – 15 May). The spring pulse flow water would not be released under the No Action.



Graph 13. Hydrology Model Results for Lake McClure Storage (Merced River) for Dry/Critical Years.

This final graph shows the expected exceedances for Lake McClure during "dry" and "critical" years for end of September storage. There would be lower storage (taf) in Lake McClure for the Proposed Action as water would be released for the spring pulse flows (15 Apr – 15 May). The No Action has no water being released from Lake McClure for the spring pulse flow, therefore, more water remains in storage (taf) in Lake McClure with the No Action during "dry" and "critical" years.

Overall, storages in Lake McClure would be lower in some years because of releases to meet the single step target flow. This would also slightly reduce reservoir spills outside of the spring pulse period.

Hydrology Model Results for Stanislaus River flows:

Exceedance graphs of flows in the Stanislaus River showed no differences between the Proposed Action and the No Action, because the Proposed Action does not make any changes to operations of New Melones so no graph was generated for this scenario.

Hydrology Model Results for New Melones Reservoir Storage (Stanislaus River):

Exceedance graphs of end of September storage in New Melones show no differences between the Proposed Action and the No Action, because the Proposed Action does not make any changes to operations of New Melones so no graph was generated for this scenario.

Discussion and Findings

No Action Alternative

Existing standards for salinity at Vernalis and dissolved oxygen on the Stanislaus will continue to be met under the No Action Alternative. There is no mechanism in place under the No Action to supply water to meet the single step D-1641 target flow and therefore the No Action would not meet D-1641 flow targets in all years. Without the supplemental pulse of cooler water that would be provided by the Proposed Action, water quality at Vernalis could decrease. The No Action Alternative may have negative direct and indirect impacts on the following water quality parameters: water temperatures (increased), dissolved oxygen (decreased), and channel inundation (reduced).

Proposed Action Alternative

Under the Proposed Action, water would be supplied from Lake McClure down the Merced and San Joaquin Rivers to Vernalis to assist Reclamation in meeting the single step D-1641 flow targets. Under the Proposed Action, increased river flows down the Merced and San Joaquin Rivers during the spring pulse flow period as measured at Vernalis, would benefit water quality when compared to the No Action. Potential direct and indirect benefits that may be realized under the Proposed Action Alternative include reduced water temperatures, increased dissolved oxygen content, and potential extension of channel inundation.

The Proposed Action is not expected to have a negative impact on water quality or hydrology.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. NOISE -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES.				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. RECREATION.				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC. Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Other Federal Environmental Compliance Requirements

Indian Trust Assests. Indian Trust Assets (ITAs) are legal interests in assets that are held in trust by the U.S. Government for Federally recognized Indian tribes or individuals. On October 21, 2011, ITA Specialist Patricia Rivera responded to Douglas Kleinsmith's (Natural Resource Specialist) request for a determination of effects to ITAs from the Proposed Action. It was determined that the Proposed Action would have no impacts to ITAs. See Appendix E.

Environmental Justice. The Proposed Action would not result in adverse human health or environmental effects on minority or low-income populations.