3.0 Environmental Setting, Impacts, and Mitigation Measures

This chapter describes the approach to the CVFPP environmental analysis and, for each environmental resource area, details the existing conditions in the study area, analyzes the environmental impacts of the CVFPP, and presents mitigation measures for significant and potentially significant impacts.

3.1 Approach to Environmental Analysis

An environmental document prepared to comply with CEQA must identify the significant environmental effects of a project. A "[s]ignificant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project (CEQA Guidelines, California Code of Regulations (CCR) Title 14, Section 15382). This EIR is a "program" EIR (PEIR) intended to provide information at a general (or programmatic) level of detail on the potential impacts of implementing the CVFPP. In addition, subsequent implementation actions stemming from adoption of the proposed program would involve additional project-level environmental review and documentation to the extent required by CEQA and the CEQA Guidelines.

3.1.1 Section Contents

Sections 3.2 through 3.21 of this PEIR follow the same general format and are each organized into the major components described below.

Environmental Setting

The "Environmental Setting" section describes the physical environmental conditions assumed in this PEIR for analyzing the effects of the CVFPP. The environmental setting generally consists of the existing physical environment as of October 27, 2010, the date when DWR published the notice of preparation (NOP) to prepare an EIR for the CVFPP and filed it with the State Clearinghouse. Under CEQA, baseline environmental conditions are typically set at the time the NOP is published (CEQA Guidelines, Section 15125(a)). However, baseline information may describe conditions at a different time, such as if the most recent data available are from a year before the NOP was published.

Regulatory Setting

The "Regulatory Setting" section describes the federal, State, regional, and local laws, regulations, plans, and ordinances relevant to the CVFPP.

Analysis Methodology and Thresholds of Significance

This section describes the methods, process, procedures, and/or assumptions used to formulate and conduct the impact analysis. It also presents the significance criteria (or "thresholds of significance") used to define the level at which an impact would be considered significant in accordance with CEQA. Thresholds may be quantitative or qualitative; they may be based on agency or professional standards or on legislative or regulatory requirements relevant to the impact analysis. Generally, the thresholds of significance are derived from Appendix G of the CEQA Guidelines, as amended; factual or scientific information and data; and regulatory standards.

Environmental Impacts and Mitigation Measures

This analysis examines all potentially significant impacts that would occur with implementation of the CVFPP. Impacts and mitigation measures are described for near-term management activities (NTMAs) and long-term management activities (LTMAs). NTMAs are those management activities that would be initiated during the first 5 years after approval of the CVFPP, with many having the potential to be completed during that initial period; LTMAs are management activities that would be initiated and implemented at any time beyond 5 years after adoption of the CVFPP.

The CVFPP is a broad-based, complex program intended to be implemented over time. Ninety-four management actions have been identified that are intended to serve as the building blocks for the program as it evolves. The NTMAs are generally more foreseeable because they are mostly continuations of activities that are currently under way, or reflect activities that are currently in the project-level planning process. It is reasonably foreseeable that many NTMAs will continue beyond 5 years, but the precise nature of LTMAs becomes less predictable. Nonetheless, certain activities can be foreseen with sufficient clarity over the long term that they are amenable to an environmental evaluation that assesses the potential significance of the impacts and identifies associated mitigation measures. The program comprehensively analyzes all available options for flood risk reduction; therefore, it also includes the possibility of certain activities that are by their nature speculative at this time, the feasibility of which may be limited by economic, practical, political, legal, environmental, or other factors. Given this range in foreseeability of the various management activities, the analysis has been prepared in a way that best matches the activities with the currently foreseeable level of detail for

those activities and the resulting level of environmental analysis that can be undertaken.

NTMAs and LTMAs are discussed further below in Section 3.1.2, "Analysis Methodology," and are described in more detail in Section 2.4, "Proposed Management Activities."

Impacts and mitigation measures are numbered sequentially in each resource section, and mitigation measures correspond to the impact being addressed. For instance, impacts in Section 3.3, "Agriculture and Forestry Resources," are numbered Impact AG-1, and Mitigation Measure AG-1 corresponds with Impact AG-1. Each impact and mitigation measure number is followed by the designation "(NTMA)" or "(LTMA)" to indicate whether the impact or mitigation measure is associated with an NTMA or an LTMA. An impact title precedes the analysis of the impact. Where two or more distinct mitigation measures apply to the same impact, a letter subdesignation is provided; for example, Mitigation Measure AG-1a (NTMA) and Mitigation Measure AG-1b (NTMA) both apply to Impact AG-1 (NTMA). The discussion that follows the impact title includes information to support the significance conclusion stated in boldface at the end of the impact discussion.

Following each discussion of a significant or potentially significant impact, any available and feasible mitigation measures are provided to avoid, minimize, rectify, or reduce the significant or potentially significant impacts to a less-than-significant level. In accordance with California Public Resources Code (PRC) Section 21081.6(b), mitigation measures must be fully enforceable through permit conditions, agreements, other legally binding instruments, or by incorporating the measures into the project design. Section 15370 of the CEQA Guidelines defines mitigation as any of the following:

- Avoiding the impact altogether by not taking a certain action or parts of an action
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation
- Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action

- Compensating for the impacts by replacing or providing substitute resources or environments

Where applicable to the environmental resource area, after the presentation of typical impacts and mitigation measures to evaluate NTMAs and LTMAs, a narrative discussion describes any other LTMA impacts that could occur, but are too general and conceptual to evaluate using the standard "impact/mitigation" approach. This narrative approach to LTMA impact discussions is described in more detail below in Section 3.1.2, "Analysis Methodology."

3.1.2 Analysis Methodology

Definition of NTMAs and LTMAs

As described above, environmental impacts are evaluated for both NTMAs and LTMAs. The impact analysis addresses construction, operations and maintenance, and policy actions for both activity categories. Construction-related, operational, and maintenance-related impacts result in direct and indirect impacts, while policy actions result only in indirect impacts. (Direct and indirect impacts are defined below in Section 3.1.4, "Impact Mechanisms.")

In each impact analysis section, NTMAs are evaluated at a greater level of specificity than LTMAs for the following reasons:

- NTMAs are better defined and less conceptual than LTMAs, are more likely to be implemented in the short term (within the first 5 years after approval of the CVFPP), and are generally less complex.

- NTMAs have more secure funding sources than LTMAs.

- Environmental impacts of NTMAs can generally be evaluated more accurately than impacts of LTMAs.

However, both NTMAs and LTMAs are evaluated at a "program" level of detail consistent with the guidance on program EIRs provided in Section 15168 of the CEQA Guidelines.

NTMAs can consist of any of the following types of activities:

- Conveyance management activities:
  - Sediment removal
  - Levee repair, reconstruction, and/or improvements:

    - Raise levees by adding earthen material or constructing floodwalls.

    - Strengthen levees to enhance their integrity by improving the properties and geometry of embankment soils to resist slope and seepage failures.

    - Address seepage with seepage berms, stability berms, impermeable barrier curtains (slurry cutoff walls) in the levee and/or its foundation, and relief wells and toe drains.

    - Armor the landside of the levees to improve levee resiliency during overtopping episodes.

    - Construct small setback levees (generally less than 0.75 mile long).

- Storage management activities:

  - Change reservoir operations criteria to alter the timing, magnitude, and frequency of flood releases to downstream channels, providing reductions in river flood stage and volume.

    - Coordinate operation among different reservoirs to increase objective releases from reservoirs.

    - More effectively use weather forecasting in conjunction with reservoir operations.

    - Use weather forecasting to support more flexibility in short-term allocations of available storage space between water supply and flood control.

- Other management activities:

  - Implement the vegetation management strategy.

  - Purchase floodplain easements and/or other interests in land.

  - Integrate conservation strategies into all implementation actions to improve the overall sustainability of, and ecosystem benefits provided by, the flood management system.

  - Refine flood emergency response, improve flood system operations and maintenance, continue floodplain risk management, conduct

feasibility studies, and implement flood risk reduction projects in coordination and partnership with local and federal agencies.

All other types of CVFPP activities fall within the LTMA category and consist of the following types of activities:

- Widening floodways (through setback levees and/or purchase of easements)
- Constructing weirs and bypasses
- Improving and remediating levees
- Constructing new levees
- Removing some facilities from the SPFC
- Using long-term forecasts to improve operation of existing reservoirs
- Achieving protection of urban areas from a flood event with 0.5 percent risk of occurrence in any given year
- Achieving protection of small communities from a flood event with 1 percent risk of occurrence in any given year
- Protecting rural-agricultural area against floods by facilitating inspection and flood fighting, improving levee performance, and purchasing agricultural easements
- Changing policies, guidance, standards, and institutional structures
- Implementing additional and ongoing conservation elements

However, because NTMA-type activities would continue to be implemented in the CVFPP study area into the longer term time frame of the LTMAs (e.g., remediation of existing levees), LTMAs include a continuation of activities described as part of the NTMAs.

Approach to Impacts and Mitigation Measures

NTMAs are evaluated first in each impact analysis section using a typical "impact/mitigation" approach. LTMAs are then evaluated. Where impact descriptions and mitigation measures identified for NTMAs also apply to LTMAs, they are also attributed to the LTMAs, with modifications or expansions as needed. In addition, in some cases, LTMAs could have impacts and require mitigation measures not previously addressed in the

discussion of NTMAs. In these cases, additional impacts and mitigation measures specific to LTMAs are provided.

For each impact discussion, the environmental effect is determined to be either less than significant, significant, potentially significant, or beneficial compared to existing conditions and relative to the thresholds of significance. Definitions for each impact category are provided below in Section 3.1.3, "Terminology Used to Describe Impacts."

Feasible mitigation measures are identified to address impacts identified as significant or potentially significant. The specificity of the mitigation measures is consistent with the broad, program-level nature of the CVFPP and the parallel program-level analysis in this PEIR. Mitigation measures identified in this PEIR would be applied as appropriate to specific future projects implemented under the CVFPP. When project-specific CEQA analyses are conducted for future projects, mitigation measures in this PEIR would be incorporated as applicable into the CEQA document and would be used to guide the development of project-specific mitigation measures.

Actual implementation, monitoring, and reporting of the PEIR mitigation measures would be the responsibility of the project proponent for each site-specific project. For those projects not undertaken by, or otherwise subject to the jurisdiction of, DWR or the Central Valley Flood Protection Board (Board), the project proponent generally can and should implement all applicable and appropriate mitigation measures. The project proponent is the entity with primary responsibility for implementing specific future projects and may include DWR; the Board; reclamation districts; local flood control agencies; and other federal, State, or local agencies. The project proponent may also be the CEQA lead agency for future site-specific projects.

Because various agencies may ultimately be responsible for implementing (or ensuring implementation of) mitigation measures identified in this PEIR, the text describing mitigation measures does not refer directly to DWR but instead refers to the "project proponent." This term is used to represent all potential future entities responsible for implementing, or ensuring implementation of, mitigation measures.

LTMA Narrative Analysis Approach

Because of the more general and conceptual nature of many LTMAs, a great deal of uncertainty exists about how some LTMAs may be implemented and what environmental effects might result from their implementation. This uncertainty is to be expected for a broad, multiyear, and in some areas, conceptual program such as the CVFPP. However, this

uncertainty also makes the use of a standard "impact/mitigation" approach unsuitable for some elements of the LTMA analysis. Therefore, in some sections of this PEIR, additional impacts of LTMAs (beyond the standard "impact/mitigation" approach) are described in a broader narrative format, along with lists of suggested mitigation strategies provided that could be applied to these impacts. The approach and methodology for these broader narrative LTMA impact discussions are described below.

At the current stage of program development, no commitments have been made and little specificity exists (e.g., regarding location, size, or operational criteria) for several categories of LTMAs, such as widening floodways and new flood bypasses. For many categories of LTMAs, substantial future study would be required to determine whether implementing such an LTMA in a particular location would be feasible economically, environmentally, legally, socially, or technologically, or based on other considerations. In addition, without further detail about the location, design, and operational criteria of potential LTMAs, a great deal of speculation could be required in some instances to assess environmental effects, determine the level of significance of these effects, and determine whether feasible mitigation is available to fully address significant effects.

Although these uncertainties exist, sufficient information often exists to at least disclose additional potential impacts of LTMAs besides those discussed in the impact/mitigation pairings provided earlier in each analysis section. Therefore, in many instances, additional LTMA impacts are described in a broad narrative format; because of the uncertainty surrounding these impacts, no determination regarding their significance is provided. Consistent with Section 15145 of the CEQA Guidelines, these impacts are too speculative for evaluation beyond the narrative disclosure provided. The speculative nature of an impact may be related to uncertainty about factors such as the following:

- The LTMA itself (e.g., Where might it be implemented? How might it be implemented? Is it feasible?)
- The nature of the impact (e.g., Would changes in flows be sufficient to result in substantial downstream erosion?)
- The availability of mitigation and its effectiveness

Future project-specific CEQA evaluations for individual LTMAs will be used to determine the potential for the narratively described impacts to occur, determine their level of significance, and identify project-specific mitigation measures for significant impacts.

Narrative impact discussions are divided among the geographic areas in the program study area (i.e., the extended systemwide planning area, Sacramento and San Joaquin Valley watersheds, and Southern California/coastal Central Valley Project/State Water Project service areas). They are further subdivided according to the type of action (i.e., construction of storage and conveyance facilities, facilities operations and maintenance from storage or conveyance actions, and other management actions).

Examples of potential mitigation strategies are provided after the narrative impact discussions to disclose the nature and extent of mitigation actions that might be necessary to address the impacts. The mitigation strategies may be considered, as applicable, during project-level evaluation of specific LTMAs. Not all mitigation strategies will apply to all LTMAs; the applicability of mitigation strategies will vary based on the location, timing, and nature of each LTMA. In addition, some mitigation strategies on their own do not constitute sufficient mitigation under CEQA (e.g., simply conducting surveys) but must be coupled with other mitigation strategies to adequately address the impacts of LTMAs.

3.1.3 Terminology Used to Describe Impacts

The PEIR uses the following CEQA terminology to denote the significance of environmental impacts:

- **No impact** indicates that the construction, operations, and maintenance of the CVFPP would not have any direct or indirect impacts on the physical environment. It means that no change from existing conditions would result. This impact level does not require mitigation.

- A **less-than-significant impact** is one that would not result in a substantial or potentially substantial change in the physical environment. This impact level does not require mitigation, even if applicable measures are available; however, measures may be recommended to further reduce less-than-significant impacts.

- A **significant impact** is defined by PRC Section 21068 as one that would cause "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project." Under CEQA, mitigation measures and alternatives must be identified, where applicable and feasible, to avoid, minimize, rectify, compensate, or reduce significant impacts to a less-than-significant level. Alternatives to the CVFPP are discussed in Chapter 5.0, "Alternatives."

- A **potentially significant impact** is one that, if it were to occur, would be considered a significant impact as described above; however, the

occurrence of the impact cannot be immediately determined with certainty. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact. Therefore, under CEQA, mitigation measures and alternatives must be identified, where feasible, to avoid, minimize, rectify, compensate, or reduce significant impacts to a less-than-significant level.

- A **significant and unavoidable impact** is one that would result in a substantial adverse effect on the physical environment and that cannot be reduced to a less-than-significant level even with implementation of any applicable feasible mitigation. Under CEQA, a project with significant and unavoidable impacts may proceed, but the CEQA lead agency (DWR) would be required to (1) conclude in findings that there are no feasible means of substantially lessening or avoiding the significant impact in accordance with the CEQA Guidelines (14 CCR Sections 15091(a)(3)) and (2) prepare a statement of overriding considerations, in accordance with the CEQA Guidelines (14 CCR Section 15093), explaining why the CEQA lead agency has chosen to proceed with the project in spite of the potential for significant impacts on the physical environment.

- A **potentially significant and unavoidable impact** is one that, if it were to occur, would be considered a significant and unavoidable impact as described above; however, there is uncertainty regarding the occurrence or severity of the impact and/or the inability of mitigation measures to reduce the impact to a less-than-significant level. For CEQA purposes, a potentially significant and unavoidable impact is treated as if it were significant and unavoidable, and findings and a statement of overriding considerations must be prepared as described above.

- An impact may have a level of significance that is too uncertain to be reasonably determined and would therefore be considered **too speculative for meaningful consideration** in accordance with the CEQA Guidelines (14 CCR Section 15145). Where some degree of evidence points to the reasonable potential for a significant effect, the EIR may explain that a determination of significance is uncertain, but is still assumed to be "potentially significant," as described above. In other circumstances, after thorough investigation, the determination of significance may still be considered too speculative to be meaningful. This is an effect for which the degree of significance cannot be determined for specific reasons, such as unpredictability of the occurrence or severity of the impact, lack of methodology to evaluate the impact, or lack of an applicable significance threshold.

- A **beneficial effect** is one that would result in a positive change in any of the physical conditions within the area affected by the CVFPP.

3.1.4 Impact Mechanisms

Mechanisms that could cause impacts are discussed for each resource area. General categories of impact mechanisms are project construction and activities related to future operations and maintenance, as described in Chapter 2.0, "Program Description."

Project impacts are effects that are categorized, pursuant to CEQA, to describe their context and intensity. Project effects fall into the following categories:

- A **temporary impact** would occur only during construction.

- A **short-term impact** would last from the time construction ceases to within 3 years after construction.

- **A long-term impact** would last longer than 3 years after construction. In some cases, a long-term impact could be considered a permanent impact.

- A **direct impact** is an impact that would be caused by an action and would occur at the same time and place as the action.

- An **indirect impact** is an impact that would be caused by an action but would occur later in time or at a distance that is removed from the impact area, but is reasonably foreseeable, such as growth-inducing effects and other changes related to changes in land use patterns and related effects on the physical environment.

- A **residual impact** is an impact that would remain after implementation of mitigation. This type of impact is not defined in the CEQA Guidelines.

- A **cumulative impact** refers to two or more individual effects that, when considered together, are considerable or that compound or increase other environmental impacts. "Cumulatively considerable" means that the incremental effects of an individual project, even if individually limited, 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. Cumulative impacts are discussed in Chapter 4.0, "Cumulative Impacts."

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