

Chapter 3 Planning Objectives and Constraints and the Alternative Development Process

Planning Objectives and Constraints

The planning objectives for the NODOS Investigation are consistent with the Federal authorization for the feasibility study and national objectives to maximize sustainable economic development while protecting the environment and avoiding unwise use of floodplains. The planning objectives also consider the resource management objectives from the CALFED ROD: water supply reliability, water quality, and ecosystem quality. Primary and secondary objectives were used to support the development and evaluation of the NODOS Investigation alternatives. The primary objectives are considered essential to developing a viable project, and the alternatives must meet all of the primary objectives to advance in the evaluation process. Alternatives are developed to effectively and efficiently meet the primary objectives. The development of new storage also provides an opportunity to provide other, secondary benefits. After developing alternatives to meet the primary objectives, the resulting opportunities to achieve the secondary benefits were evaluated.

Planning Objectives

The primary and secondary planning objectives for the NODOS feasibility studies are based on the identified problems, needs, and opportunities discussed in Chapter 2, Problems, Needs and Opportunities. These planning objectives incorporate national, state, and study-specific goals.

The primary objectives for the NODOS feasibility studies are:

- Improve water supply and water supply reliability
- Provide incremental Level 4 water supply
- Improve the survival of anadromous fish and other aquatic species
- Improve Delta environmental and export water quality

The NODOS alternatives are formulated to achieve these primary objectives, and evaluated to assess their effectiveness in achieving these objectives.

The secondary objectives are:

- Provide sustainable hydropower generation
- Provide opportunities for recreation
- Provide flood-damage reduction

The NODOS alternatives are not formulated to maximize the secondary objectives, but opportunities to achieve them were included in the alternatives and evaluated to the extent that

they are available. Problems, needs, and opportunities and the corresponding objectives are identified in Table 3-1.

National Goals

The Water Resources Development Act of 2007, Section 2031, Water Resources Principles and Guidelines, establishes National Water Resources Policy and specifies that Federal water resources investments shall reflect national priorities, encourage economic development, and protect the environment by:

- Seeking to maximize sustainable economic development
- Seeking to avoid the unwise use of floodplains and flood-prone areas, and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used
- Protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems

This document is grandfathered in to the 1983 guidelines, and incorporates the 2007 congressional guidance when possible.

No hierarchal relationship can be specified for these goals. As a result, trade-offs among potential solutions need to be evaluated during the decision-making process. Federal investments in water resources as a whole should strive to maximize public benefits, with appropriate consideration of costs (WRC 2013). Public benefits include environmental, economic, and social goals. Both monetary and non-monetary effects may be considered.

California Goals

In addition to the national goals and requirements, California's objective for the feasibility studies is to provide technical and financial information to implementing agencies. Key factors that agencies must consider are whether the NODOS/Sites Reservoir Project can be implemented to ensure public health and safety, and whether it can provide statewide benefits (e.g., water supply reliability, water quality, ecosystem restoration) at a reasonable cost. In the California process, an EIR is required for project environmental compliance under CEQA, and to identify permitting and mitigation requirements. Reclamation and the Authority are preparing a joint EIR/EIS in support of the NODOS feasibility studies (Reclamation and Authority 2017).

Table 3-1. Summary of Problems, Needs, Opportunities, and Planning Objectives

Problems	Needs	Opportunities	Planning Objectives
Water supply and water supply reliability			
Water supply reliability for agricultural, municipal, and industrial use has decreased appreciably, resulting in loss of system resiliency.	Need improved water supply reliability to meet current and future challenges associated with increasing population, agriculture production, environmental needs, and climate change.	NODOS provides an additional water source that could be operated cooperatively with the CVP/SWP system to improve: <ul style="list-style-type: none"> • Agricultural water supply reliability (CVP water contractors, SWP water contractors, and local agricultural water districts) • M&I water supply reliability (CVP water contractors, SWP water contractors, and local agencies) • Level 2 water supply for wildlife refuges 	Improve water supply and water supply reliability
Incremental Level 4 water supply for wildlife refuges			
Maintaining CVPIA water supply requirements for Federal and State wildlife refuges.	Need reliable water supplies to provide for optimum habitat management on the refuges.	NODOS provides an additional water source that can be cooperatively operated with the CVP/SWP system and used for consistent delivery of incremental Level 4 water to the refuges.	Provide incremental Level 4 water supply for wildlife refuges
Survivability of anadromous fish and other aquatic species			
Populations of anadromous and endemic fish species in the Sacramento Valley river system are declining due to warmer water temperatures and low flows.	Need additional cold water for anadromous fish migration, spawning, and rearing.	NODOS provides an additional water source that could be operated cooperatively with the CVP and SWP systems to provide water to help stabilize river flows in the fall, and facilitate the release of additional cold water (from Shasta and Oroville Dams) to benefit Sacramento River anadromous fish and other aquatic species.	Improve the survival of anadromous fish and other aquatic species
Water quality			
Delta water quality concerns associated with flows, salinity, water temperature, and toxins negatively affect Delta fisheries and water supplies for urban and agricultural needs.	Need additional water of sufficient quantity, quality, and temperature to meet drinking water, agriculture, and environmental restoration needs.	NODOS provides an additional water source that could be operated cooperatively with the CVP and SWP systems to facilitate several ecosystem restoration and enhancement actions to improve conditions in the Delta and Sacramento River watershed.	Improve water quality in the Delta environment and for Delta export
Sustainable hydropower generation			
Demands for power in the state are expected to increase as population, industry, and associated infrastructure growth occurs in the future.	Need new power sources that can meet California's stringent GHG regulations.	NODOS provides new pumped storage hydropower to meet the state's need for additional sustainable energy supplies with reduced GHG emissions.	Provide sustainable hydropower generation.

Table 3-1. Summary of Problems, Needs, Opportunities, and Planning Objectives

Problems	Needs	Opportunities	Planning Objectives
Recreation			
Demands for flat-water, river, and land-based recreation are expected to increase as population increases.	Need additional recreation areas to meet the region's increased demands.	NODOS provides a new reservoir with recreation areas that could help meet current and future demands.	Provide opportunities for recreation.
Flood-damage reduction			
Flooding occurs in the Colusa Basin watershed between October and April.	Need to capture or attenuate the peak flood flows responsible for flooding in the watershed.	NODOS provides a new reservoir that could capture and attenuate flood flows, thereby providing flood-damage reduction to the community of Maxwell and the Colusa Basin Drain.	Provide flood-damage reduction

- CVP = Central Valley Project
- CVPIA = Central Valley Project Improvement Act
- GHG = greenhouse gas
- NODOS = north-of-the-Delta offstream storage
- SWP = State Water Project

Planning Constraints

The scope of the feasibility studies process is limited by basic constraints specific to the NODOS feasibility studies, which include the following:

CALFED ROD: The CALFED ROD is a general framework for addressing CALFED. It includes program goals, objectives, and projects intended primarily to benefit the Delta system, its tributaries, and areas that receive water supplies exported from the Delta. In addition to the NODOS feasibility studies, the Preferred Program Alternative in the CALFED ROD includes four other surface water and various groundwater storage projects to help meet water supply needs, improve water quality, and improve the ecosystem functions of the Delta system. Although the CALFED ROD does not identify NODOS as a specific project to be pursued, the ROD does identify NODOS (the proposed Sites Reservoir) as a project requiring further investigation. Developed plans should, therefore, incorporate the goals, objectives, and programs or projects of the CALFED ROD.

Offstream Storage

By definition—and consistent with the CALFED ROD—the NODOS feasibility studies are focused on offstream storage locations. The creation of reservoirs that would interrupt major watercourses and impede the migration of fish is not the subject of this investigation.

Laws, Regulations, and Policies

Laws, regulations, and policies that must be considered include, but are not limited to, NEPA, the Fish and Wildlife Coordination Act, the Clean Air Act, the Clean Water Act (CWA), the National Historic Preservation Act (NHPA), the Federal Endangered Species Act (ESA), and the California ESA, CEQA, and the CVPIA. The CVPIA of 1992 (P.L. 102-575) influences water supply deliveries, river flows, and related environmental conditions.

Public Outreach Plan

Efforts to engage the public, stakeholders, Federally recognized tribes, non-governmental organizations (NGOs), and public agencies in decisions affecting the NODOS Project continue to play an important role in the investigation.

Consistent with NEPA, CEQA, and the P&Gs, Reclamation and the Authority have met directly with stakeholders, elected officials, NGOs, agencies, Federally recognized tribes, and the public (including affected landowners) throughout the NODOS Investigation. This interaction has included formal public meetings, focused meetings with specific stakeholder groups, briefings to elected officials, and tours of the reservoir footprint area. The purpose of this engagement has been, and continues to be, aimed at:

- Identifying and engaging the broadest number of stakeholders possible
- Creating and maintaining project transparency by providing project information in a timely and unbiased fashion
- Identifying and resolving issues and concerns within the parameters of the NEPA/CEQA process

Specific outreach activities to support the NODOS Investigation continue, with the goal of expanding awareness of the project, obtaining community support for the project, maintaining transparency and accountability to the public, reducing legal risk, and providing opportunities for public input at appropriate investigation milestones (see Table 3-2).

Table 3-2. Public Outreach

Outreach	Date	Purpose
Sites Project Authority board meetings	Held monthly	Project progress and issues
California Water Commission meetings	Held monthly	(State) WSIP funding
Tribal coordination meeting with Colusa Indian Community Council	October 2016	Project awareness and progress; tribal feedback/concerns
Landowner meetings	Variable	Project awareness and progress; tribal feedback/concerns
Study Area tours	Variable	Project awareness and progress

WSIP = Water Storage Investment Program

CALFED Evaluation of Statewide Reservoir Locations

The 2000 CALFED PEIS/EIR Preferred Program Alternative and associated CALFED ROD (CALFED 2000a, 200b) recommended that five surface water storage projects be pursued with project-specific studies. These five studies were Shasta Lake Enlargement, Los Vaqueros Reservoir Enlargement, Sites Reservoir, In-Delta Storage, and development of storage in the upper San Joaquin River Basin. As described in the CALFED ROD:

“...for actions contained within the Preferred Program Alternative that are undertaken by a CALFED Agency or funded with money designated for meeting CALFED purposes, environmental review will tier from the [CALFED] Final PEIS/R.”

However, the CALFED ROD states that the Sites Reservoir Project would “require substantial technical work and further environmental review and development of cost-sharing agreements before decisions to pursue [it] as part of the CALFED Program.” These studies were completed as part of this Draft EIR/EIS.

The preliminary studies in support of the CALFED PEIS/EIR considered more than 50 surface water storage sites (Figure 3-1) throughout California and recommended more detailed study of the five sites identified in the ROD (CALFED 2000a, 2000b, 2000c). Consistent with the above guidance in the CALFED ROD, this Draft EIR/EIS relies on evaluations and alternatives development and screening included in the CALFED PEIS/EIR and focuses on the subsequent action of evaluating the development of the Sites Reservoir Project. Accordingly, the Sites Reservoir Project is an action contained within the CALFED Preferred Program Alternative.



Source: Adapted from CALFED 2000c.

Figure 3-1. Locations of 52 Potential Reservoir Sites in Initial Evaluation

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Specifically, CALFED looked for sites that could contribute substantially to its multiple-purpose objectives. These objectives included potential sites that could provide broad benefits for water supply, flood control, water quality, and the ecosystem. CALFED eliminated locations providing less than 0.2 MAF of storage and those that conflicted with CALFED solution principles, objectives, or policies

Of the 52 surface storage sites considered, 40 were removed from CALFED's list during the initial evaluation process detailed in the *Initial Surface Water Storage Screening Report* (CALFED 2000c).

Alternative Development Process

As discussed in Chapter 1, Introduction, the development of alternatives for the NODOS feasibility studies has been an iterative process that was initiated with the CALFED ROD (see Figure 1-2). The planning process for the NODOS feasibility studies includes four major phases with their respective milestone products: the NODOS Initial Alternatives Information Report (i.e., the IAIR) (Reclamation and DWR 2006b); the PFR (Reclamation and DWR 2008); status reports, including the 2013 Progress Report (Reclamation and DWR 2013); and the forthcoming documentation of the feasibility studies.

The IAIR documented the first stage in the planning process, and identified several features and activities (structural and non-structural)—called management measures—that met the planning objectives. The IAIR summarized the preliminary screening for the management measures that focused on the evaluation of potential reservoir locations. During the IAIR stage, the Red Bank Project offstream storage alternative was not recommended for further inclusion in the development of measures because of its considerable fishery and environmental impacts. Recognizing the limited scope of the IAIR and the iterative nature of the planning process, the PFR developed a more complete evaluation of management measures and the evaluation of a series of initial alternatives.

Further evaluation of the NODOS alternative reservoir locations and refined alternatives is presented in this report.

Figure 3-2 shows the complete process for developing the initial alternative plans and the final selection of the recommended plan.

Identification and Evaluation of Measures to Address Primary Planning Objectives

Numerous management measures have been identified to address each of the primary planning objectives. The development of measures has been an iterative process. Measures were initially identified in the IAIR, and subsequently refined in the PFR and the subsequent feasibility studies process.

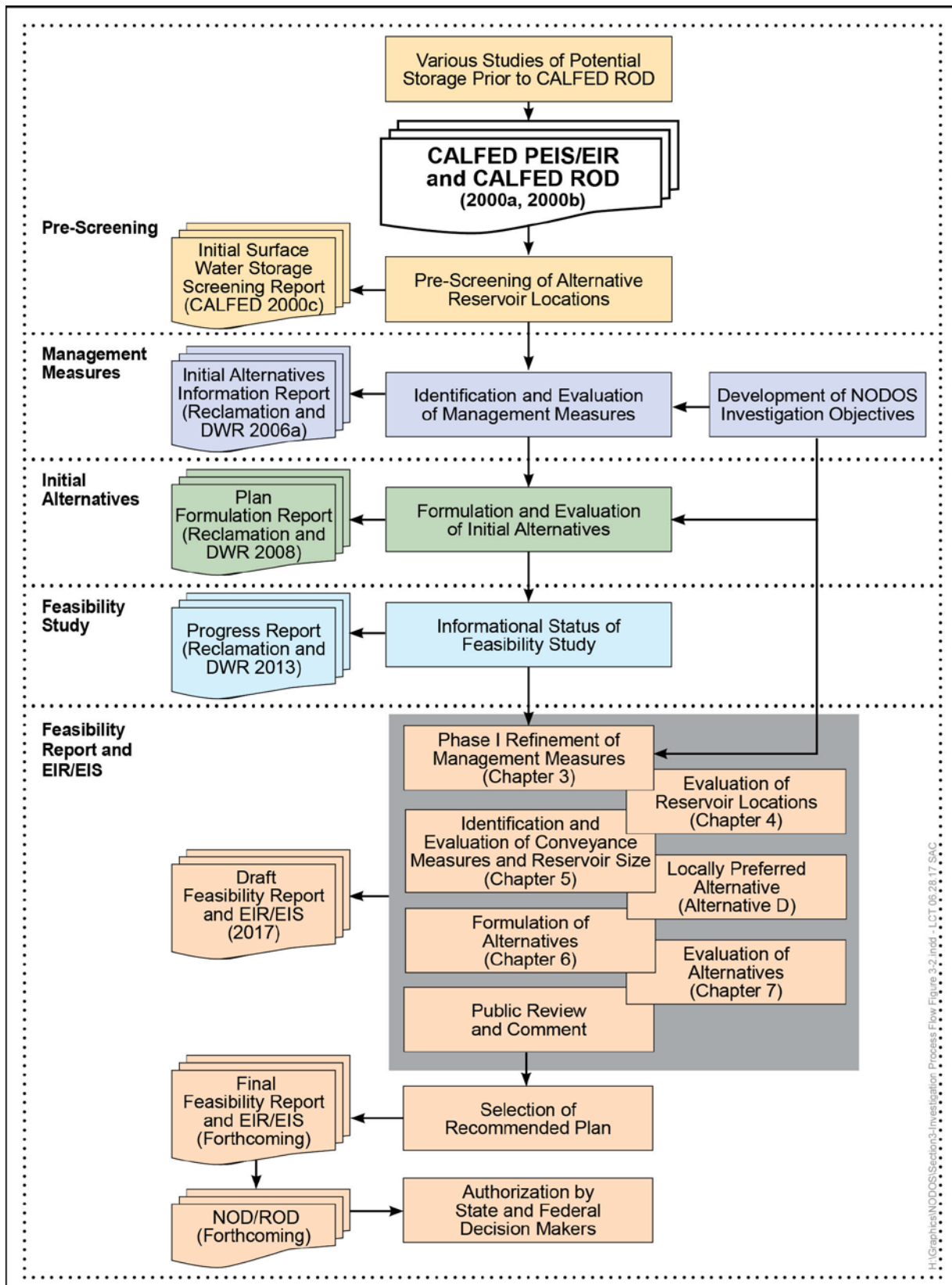


Figure 3-2. NODOS Feasibility Study Process

Table 3-3 identifies the measures that best address the primary and secondary planning objectives. Measures carried forward best address the objectives for the NODOS feasibility studies, given the consideration of planning constraints and criteria.

The evaluation of NODOS measures included modeling the ability of the system to meet demands under extended dry conditions. Under these conditions, three of the water supply measures (water use efficiency, additional recycling, and water transfers) were found to play a necessary and important role—in combination with the NODOS measures—in improving water supply reliability.

The management measures and further details regarding their evaluation are provided in Appendix A, Plan Formulation. These three measures were evaluated through the use of the Least-Cost Planning Simulation Model (LCPSIM) to assess water supply benefits, rather than by building specific targets for these actions into the No Project Alternative hydrodynamic modeling effort.

Table 3-3. Retained Management Measures to Address Primary Planning Objectives

Objectives	Management Measures
Water supply and water supply reliability	Develop NODOS measures for offstream storage
	Incorporate water-use efficiency methods
	Incorporate additional recycling
	Transfer water between water users and source shift (i.e., use groundwater in lieu of surface water and vice versa to better manage water resources)
	Improve flows and temperature by integrating a new offstream storage facility into system operations
Incremental Level 4 water supply for wildlife refuges	Reduce year-to-year variability in acquired water supply from willing sellers by developing NODOS measures
Anadromous fish and other aquatic species	Improve water quality by increasing flows to the Delta from new offstream surface storage (NODOS measures)
Water quality	Improve water quality by increasing flows to the Delta from new offstream surface storage (NODOS measures)
Hydropower generation	Incorporate pumped storage into the NODOS/Sites Reservoir Project
Flood-damage reduction	Provide local flood-damage reduction benefits
Emergency response	Provide freshwater release in response to Delta levee failures
Recreation	Provide flat-water recreation benefits

NODOS = north-of-the-Delta offstream storage

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