

Department of Water Resources

Information Technology Capital Plan



**Information Technology Capital
Plan, Plan Year 2009-10 through
2013-14 Executive Approval
Transmittal**

Department Name

APPROVAL SIGNATURES

I am submitting the attached Information Technology Capital Plan as required by the State Administrative Manual Section 4904.

I certify that the IT Capital Plan was prepared in accordance with State Information Management Manual section 57 and that the proposed IT projects are consistent with our business strategies and information technology strategy.

I have reviewed and agree with the information in the attached Information Technology Capital Plan.

Chief Information Officer		Date Signed
Printed name: Tim Garza		
Information Security Officer		Date Signed
Printed name: Tony Lourick		
Budget Officer		Date Signed
Printed name: Perla Netto-Brown		
Department Director		Date Signed
Printed name: Lester Snow		

DEPARTMENT IT CAPITAL PLAN

Department Name and Org Code:

Water Resources 840

Plan Year:

2009-10 through 2013-14

1. Summarize your organization's business goals and objectives below:

DWR's Strategic Planning Goals:¹

- A. Develop and assess strategies for managing the State's water resources, including development of the California Water Plan Update.
- B. Plan, design, construct, operate and maintain the State Water Project to achieve maximum flexibility, safety, and reliability.
- C. Protect and improve the water resources and dependent ecosystems of statewide significances, including the Sacramento/San Joaquin Bay-Delta Estuary.
- D. Protect lives and infrastructure as they relate to dams, floods, droughts, watersheds impacted by fire and disasters, and assist in other emergencies.
- E. Provide policy direction and legislative guidance on water and energy issues and educate the public on the importance, hazards, and efficient use of water.
- F. Support local planning and integrated regional water management through technical and financial assistance.
- G. Perform efficiently all statutory, legal and fiduciary responsibilities regarding management of State long-term power contracts and servicing of power revenue bonds.
- H. Provide professional, cost effective, and timely services in support of DWR's programs, consistent with governmental regulatory and policy requirements.

2. What are your organization's plans to upgrade or replace your IT infrastructure for the following? When responding, please indicate the timeframes of your intended upgrade or replacement efforts.

During December of 2007, Intel Solution Services (ISS) worked with the Department of Water Resources (DWR), Division of Technology Services (DTS) to review the department's IT infrastructure and develop an action plan to modernize the IT infrastructure. The plan is divided into three eight-month phases, which includes the key areas of: Data Center Facilities; Servers Consolidation and Virtualization; Data Storage and Management; Network Upgrades; and Client Computing.

A key objective of DWR's IT Infrastructure Modernization Plan is to support the State's and the Department's "Green Initiatives;" efficient use of energy and reduction in carbon emissions.

There are three significant ways that this IT Modernization Plan supports this objective:

- (1) The data center's current use of cooling and airflow is very inefficient. By properly sealing the air plenums and managing the airflow, a reduction in energy can be realized.
- (2) Reduce the age and number of servers. Refresh of older servers with more energy efficient servers can reduce energy consumption. Further, reducing the number of servers through consolidation and virtualization will reduce energy consumption.

¹ From the 2005 DWR Strategic Business Plan.

- (3) Refresh desktop computers: Replacing/retiring PC's that are out-of-date and following an industry standard PC refresh cycle will replace older PC's with more energy efficient PC's.

2.1. Hardware

DWR adheres to the methodology that critical infrastructure equipment replacement must technologically integrate with the existing and planned enterprise architecture. The Department incorporates upgrades and refreshes in all equipment replacement efforts as part of its regular planning processes. The Department plans for and works towards budgeting for the dollars necessary to support the purchase of this hardware. In addition to the hardware purchases, DWR plans and manages annual hardware maintenance, as necessary, as part of the yearly budget building process. DWR plans to follow a practice of replacing approximately 20-25 percentage of its enterprise infrastructure hardware every Fiscal Year (FY) based on aging of the equipment. The infrastructure components incorporated in these annual replacement processes are networks, servers, desktop computers, laptops, and communication equipment.

The Department's server infrastructure environment, applications and data, and associated tools are also being planned and managed so that it will be able to effectively support DWR new enterprise architecture direction. In order to meet the needs of DWR it is necessary to design, deploy, and maintain a highly available and dependable server environment. To ensure that the server infrastructure is kept current with today's technologies and is being utilized in a cost effective manner, the purchase, refresh, and upgrade of the infrastructure is required on a fluid and consistent basis. In accordance with the IT infrastructure review, the objective with the existing hardware is intelligent consolidation of servers across applications and the organization, then virtualization for refresh and efficiency. The major changes related to DWR's server infrastructure that will occur starting in FY 2008/09 and be completed in FY 2010/11 are:

- *Revise SAP Server Architecture and Refresh Servers:* Redesign and reconfiguration of the SAP servers; include high-availability, consolidation, disaster recovery, data archiving, efficient use of development and test systems.
- *Server Consolidation:* Reduce the number of servers supported by consolidating within like functions (email, domain controllers, file/print, SAP) and across sites.
- *Server Virtualization:* Convert under-utilized servers to virtual machines; focus on non-production environment (i.e. development, QA) first. Set a goal to convert 35% of servers to virtual machines. 80% of servers studied at DWR showed opportunity for virtualization; not all are practical.
- *Exchange Environment:* Redesign and compress the current distribute layout of the Department Exchange server environment. Note: This effort may change, due to the fact DWR is actively looking into the e-mail services provide by the Department of Technology Services.

The Department of Water Resources employees are dependent on employee productivity equipment (PC's, monitors, printers, and laptops) to conduct business and support DWR's mission. Standard refreshment rates are integral to ensure that the equipment remains functional and does not negatively impact productivity. IT strategic plan is to replace employee productive equipment every four years. The replacement plan for employee productivity equipment is:

- FY 2008/09 - State Water Project Divisions, Public Safety and Security Divisions, Division of Technology Services, Division of Fiscal Services
- FY 2009/10 – Delta and Statewide Water Management Divisions, Regional Water Planning and Management Divisions
- FY 2010/11 – Remaining DWR business areas

DWR is moving toward the use of enterprise data storage and industry best practices for the management of its' business data. Within the industry, the use of SAN data storage in the data center is growing as the cost of SAN storage and connecting servers is dropping. Over the period of FY 2008/09 through FY 2011/12 DWR will be migrating all data from direct attached storage to SAN data storage. The IT Division is currently working on plans to expand the use of SAN and to use the additional EMC SAN frame for Windows shared folders and NAS. This will improve data reliability and availability.

2.2. Software

Key strategies include consolidation of four server based operating systems down to two: Linux and Windows in the FY 2009/10-2010/11 time frame. In addition, redefine the enterprise software family, negotiate enterprise licensing agreements, and redefine standard software for the organization.

DWR's continued migration to a centralized IT environment has provided opportunity to benefit from the Core Client Access License (CAL) licensing structure to the Enterprise CAL structure. DWR will implement or upgrade the following enterprise services:

- Exchanger 2000 to Exchange 2007: Implementation starts in FY 2008/09 and is completed FY 2009/10
- MS-Office 2000 to MS-Office 2007: Complete in FY 2008/09
- Adobe 8.0: Complete in FY 2008/09
- Data Center Master Console Management Services –Implementation starts in FY 2008-09 and is completed FY 2010-11
- Enterprise Project Portfolio: Start in FY 2009/10 and complete in FY 2010/11
- Enterprise Portal: Start in FY 2009/10 and complete in FY 2010/11

2.3. DWR Business Network

The DWR network technology environment is also planned, managed, and budgeted using the same model as hardware and software with strict adherence being paid to the overall enterprise architecture.

The Department will upgrade their existing firewalls across the FY 2008/09 and FY 2009/10 timeframes according to vendor End of Life and End of Service announcements.

The Department will upgrade about half of the existing routers across the FY 2009/10 and FY 2010/11 timeframes according to vendor End of Life and End of Service announcements.

a. Office LAN Upgrade – FY 2008/09 and FY2009/10

- Upgrade remaining 10 Mbps desktops connects to 100Mbps
- Upgrade older switches serving office areas to 100 Mbps
- Set and follow standard refresh cycle for network switches
- Deploy wireless LANs for Conference Rooms, Warehouses, Maintenance Yards, Laboratories, and other locations where it is more cost effective than a wired solution.

b. Active Directory – FY 2009/10

Eliminate/reduce the total number of Domains within DWR to a single Domain so that the entire organization can be better equipped for enterprise data sharing and consolidation of IT management efforts.

c. Data Center – FY08/09 and FY09/10

- Review and change switches and routers that have a single points of failure
- Upgrade switches in data center to support 1-Gbps capacity as standard to all servers
- Redesign and implement servers connect for applications designed for high-availability so they are not on the same network devices or segments.
- Assess critical applications for network path single point of failures; make changes to add network path redundancy

d. Capacity between Data Center and Disaster Recovery Site - FY 2009/10

Increase capacity (100mb-1gbps) to support data replication and high availability application designs.

e. Network Capacity to Remote DWR Sites – FY 2008/09-FY2009/10

Increase WAN link capacity to 45 Mbps to support increased data activity, remote software downloads, server consolidation, remote back-ups and high-bandwidth applications such as GIS.

f. Network Trending and Monitoring Tool – FY 2008/09

Acquire better capacity monitoring and troubleshooting tools for network support group

2.4. State Water Project (SWP) SCADA Network

The Department is upgrading the SCADA Wide-Area Network capacity through the currently approved SWP Communications Upgrade Project.

The Department will upgrade the firewalls to the California Independent System Operator and for the SCADA network in the FY08/09 and FY09/10 timeframe, respectively according to vendor End of Life and End of Service announcements.

The Department will upgrade the existing East Branch Extension SCADA routers according to vendor End of Life and End of Service announcements in the FY09/10 timeframe.

The Department will upgrade about half of the existing SWP SCADA routers across the FY 2009/10 and FY 2010/11 timeframes according to vendor End of Life and End of Service announcements.

3. Existing Approved Reportable IT Projects

Provide the following information regarding your existing approved reportable IT projects on Table 1 on the following page:

- Existing IT Project;
- Approved Project Cost;
- Project Number; and
- Implementation Date

4. Proposed IT Projects

After each proposed IT project has been documented by answering questions 4.9.1 through 4.9.15 of the attached IT Project Proposal Form, provide the following information on Table 2 on the following page:

- The name of each proposed IT project;
- The priority ranking;
- The FSR submission date; and
- The estimated cost

3. Table 1-Existing Approved Reportable IT Projects Summary by Department

Existing IT Project	Approved Project Cost*	Project Number	Implementation Date
California Irrigation Management Information System	\$1,038,000 ²	TBD ³	2008/2009 Q3
Enterprise Document Management System	\$ 2,500,000	TBD ⁴	2008/2009 Q3
Business 2000 Phase 2C: Optimization (Future Operations)	\$17,600,000.00	3860-60	2013/2014 Q3

***Note:** If a Special Project Report (SPR) was submitted for review in July 2008 that includes project costs that differ from the last approved project document, enter both the last approved project cost and the revised project cost from the SPR under review.

4. Table 2-Proposed IT Project Summary

Proposed IT Project	Priority Ranking	FSR Submission Date	Estimated Total Cost
A. California Water Data Management	4	January 2011	\$ 7,000,000
B. Enterprise GIS Program	1	January 2009	\$ 2,000,000
C. Environmental & Scientific Analytics Program	5	January 2012	\$ 1,500,000
D. Telemetry Optimization	3	January 2011	\$ 3,000,000
E. Water Planning Information Exchange (Water PIE)	2	January 2009	\$ 8,000,000

² Per FSR submitted to the OCIO in June 2008.

³ Approval has not yet been received from the OCIO.

⁴ The FSR is still under development and has not yet been submitted to the OCIO.

Enterprise Architecture

A. California Water Data Management

A.4.1. Proposal name and priority ranking:
California Water Data Management: priority rate 4

A.4.2. Description of the proposed IT project:
Assess the various water data and water related information stores:

- California Data Exchange Center (CDEC)
- Water Data Library (WDL)
- Bay-Delta and Tributaries (BDAT)
- Interagency Ecology Program (IEP)
- California Integrated Management Information System (CIMIS)

These information stores were created over time to support multiple business needs of the Department, the State, multiple federal agencies, the State Water Contractors, dam operators, and various other constituents in the state and country. With the passage of time, the inevitable redundancy in data collection, transfer, storage and retrieval has not been assessed to implement an effective and efficient overall data strategy. In part, this project will:

- Develop a standard approach to data collection, storage, back-up and recovery.
- Define the data management strategy and data dictionary.
- Integrate data with a GIS-based presentation

A.4.3. Which of your department's business goals and objectives does this project support, and how?

- A. *Develop and assess strategies for managing the State's water resources, including development of the California Water Plan Update.*
- B. *Plan, design, construct, operate and maintain the State Water Project to achieve maximum flexibility, safety, and reliability.*
- C. *Protect and improve the water resources and dependent ecosystems of statewide significances, including the Sacramento-San Joaquin Bay-Delta Estuary.*
- D. *Protect lives and infrastructure as they relate to dams, floods, droughts, watersheds impacted by fire and disasters, and assist in other emergencies.*
- E. *Provide policy direction and legislative guidance on water and energy issues and educate the public on the importance, hazards, and efficient use of water.*
- F. *Support local planning and integrated regional water management through technical and financial assistance.*
- H. *Provide professional, cost-effective, and timely services in support of DWR's programs, consistent with governmental regulatory and policy requirements.*

Enterprise Architecture

As previously mentioned, these information stores support not only the Department's business needs such as managing water flow through the State Water Project and performing "what if" analyses for surface storage options but also other State, multiple federal agencies, the State Water Contractors, dam operators, and various other constituents in the state and country. The Department's CDEC website alone generated 3,322,207 peak weekly hits in 2006.

At an even higher level, these data stores provide intrinsic support of the Department's mission:

To manage the water resources of California in collaboration with others to benefit the State's people, and to protect, restore, and enhance the natural and human environment.

A.4.4. What are the expected business outcomes or benefits of the proposal as they relate to your organization's business goals and objectives?

- Integration of real-time hydrologic, environmental and weather information (e.g., river forecasting, water supply forecasting, and snow melt forecasting.) with reservoir operations, State Water Project operations, flood operations, hydraulic model development, and Delta water quality monitoring.
- Integration of the California levee inventory with annual levee inspections (e.g., flood damage, levee encroachment.) and levee integrity modeling.
- Development of a capital outlay project (storage, flood management, levee development/repair) life cycle that is integrated with the funding streams that support such projects.
- In conjunction with the Enterprise GIS Program, deploy a map-based view of the data with the appropriate overlays (e.g., levee system, State Water Project, Delta, area of responsibility, environmental information.)

A.4.5. The following are from the State's IT strategic plan. Check the appropriate box(s) to identify the goals this proposal supports:

- Supporting and enhancing services for Californians and businesses
- Enhancing information and IT security
- Reducing state operational costs (leveraging, consolidation, new technology, etc.)
- Improving the reliability and performance of IT infrastructure
- Enhancing human capital management
- Supporting state and agency priorities and business direction

A.4.6. Is the proposal consistent with your organization's Enterprise Architecture?

- Yes
- No

If no, please explain why the deviation from the organization's Enterprise Architecture is necessary.

Enterprise Architecture

A.4.7. Will the proposed system collect, store, transmit, or exchange confidential or sensitive information?

Yes

No

A.4.8. If this proposal is conceptually approved, what is the estimated date (mm/yyyy) the FSR will be submitted?

01/2011

A.4.9. What is the estimated project start date (mm/yyyy) if the FSR is approved?

07/2012

A.4.10. What is the duration of the proposed project?

Three years

A.4.11. Will the proposed project utilize the existing infrastructure?

Yes

No

If no, please explain.

Once the various data stores have been assessed, and the proposed data architecture defined, the existing infrastructure may not be sufficient to support the project. In addition, DWR new service oriented architecture environment should have evolved sufficiently to allow the Department to capitalize on it.

A.4.12. Is the proposal related to another proposal or to an existing project?

Yes

No

If yes, describe the related proposal or project and how it is related:

Enterprise GIS Program: The architecture and application developed to support the GIS program must be in place before an effective presentation strategy for the existing data stores can be developed.

Telemetry Optimization – As a significant amount of the Department's data is collected via telemetry, data management and telemetry optimization efforts must be synchronized.

A.4.13. Describe the consequences of not doing this proposed project at the planned timeframe:

The inefficiencies and out-of-synch data gaps will continue to exacerbate with the passage of time. For example, the scope and level of effort to develop the mandated five year update to the State Water Plan (Bulletin 160) grows exponentially as pressure mounts for the Department to provide a plan that encompasses a growing population, diversifying needs, ecological concerns,

Enterprise Architecture

and shrinking supply. The disparate data sources result in a significant amount of staff hours spent reconciling the data instead of interpreting the data and legal challenges.

A.4.14. Check the appropriate box(s) to identify the proposal's funding strategy:

- Augmentation needed
- Redirection of existing funds
- Other (describe):

Flood Proposition and State Water Project

A.4.15. What are the estimated cost and funding source(s) by fiscal year through implementation (information should be provided in the following format):

Fund Source	2009-10	2010-11	2011-12	2012-13	2013-14 and future	Total
General Fund				\$ 2,000,000		
Federal Fund						
Special Fund*				\$ 5,000,000		
Total				\$ 7m		

* Note: Identify the fund source and if the department is the sole user of the fund.

State Water Project and Flood Propositions

Enterprise Architecture

B. Enterprise GIS Program

B.4.1. Proposal name and priority ranking:

Enterprise GIS Program: priority rank 1

Description of the proposed IT project:

The Enterprise GIS Program will establish a platform for delivering organization-wide geospatial capabilities, a method that provides for this free flow of information. Core to enterprise GIS is the ability to meet organizational objectives through the delivery of geospatial capabilities that include: data management, visualization, and spatial analysis.

B.4.2. Which of your department's business goals and objectives does this project support, and how?

- A. *Develop and assess strategies for managing the State's water resources, including development of the California Water Plan Update.*
- B. *Plan, design, construct, operate and maintain the State Water Project to achieve maximum flexibility, safety, and reliability.*
- C. *Protect and improve the water resources and dependent ecosystems of statewide significances, including the Sacramento San Joaquin Bay Delta Estuary.*
- D. *Protect lives and infrastructure as they relate to dams, floods, droughts, watersheds impacted by fire and disasters, and assist in other emergencies.*
- F. *Support local planning and integrated regional water management through technical and financial assistance.*
- H. *Provide professional, cost effective, and timely services in support of DWR's programs, consistent with governmental regulatory and policy requirements.*

GIS maps are interactive. On the computer screen, map users can scan a GIS map in any direction, zoom in or out, and change the nature of the information contained in the map. They can choose whether to see the levees, how many levees to see, and how levees should be depicted. Then they can select what other items they wish to view alongside these levees such as weirs, county or water district lines, rivers or lakes. In addition, perform sophisticated calculations for tracking water flow, either surface or underground or predicting erosion patterns.

B.4.3. What are the expected business outcomes or benefits of the proposal as they relate to your organization's business goals and objectives?

- Key to achieving strategic business objectives
- Scalable, extensible, reliable, and secure
- Open, interoperable, and standards based
- Capable of being effectively integrated within the enterprise
- Recognized as very complex to implement and thus requiring significant planning and support

Enterprise Architecture

- Providing data in spatial format such as multi layered maps showing surface matter such as dirt, water, plants, animals, insects, air temperature and environmental conditions and below ground elements such as water and minerals

B.4.4. The following are from the State's IT strategic plan. Check the appropriate box(s) to identify the goals this proposal supports:

- Supporting and enhancing services for Californians and businesses
- Enhancing information and IT security
- Reducing state operational costs (leveraging, consolidation, new technology, etc.)
- Improving the reliability and performance of IT infrastructure
- Enhancing human capital management
- Supporting state and agency priorities and business direction

B.4.5. Is the proposal consistent with your organization's Enterprise Architecture?

- Yes
- No

If no, please explain why the deviation from the organization's Enterprise Architecture is necessary.

B.4.6. Will the proposed system collect, store, transmit, or exchange confidential or sensitive information?

- Yes
- No

B.4.7. If this proposal is conceptually approved, what is the estimated date (mm/yyyy) the FSR will be submitted?
01/2009

B.4.8. What is the estimated project start date (mm/yyyy) if the FSR is approved?
08/2009

B.4.9. What is the duration of the proposed project?
24 Months

B.4.10. Will the proposed project utilize the existing infrastructure?

- Yes
- No

If no, please explain.

Enterprise Architecture

B.4.11. Is the proposal related to another proposal or to an existing project?

- Yes
- No

If yes, describe the related proposal or project and how it is related:

California Water Data Management and Water PIE– Data analysis will be greatly enhanced with the addition of spatial views.

B.4.12. Describe the consequences of not doing this proposed project at the planned timeframe:

- Data integrity problems exist since no centralized repository exists
- Non-standards based environment promoting: security risks, non-inoperability, and unreliability
- Inability to be effectively integrated within the enterprise
- Impeded ability to make accurate and timely business decisions to with respect to environmental protection and to support the State Water Project.

B.4.13. Check the appropriate box(s) to identify the proposal's funding strategy:

- Augmentation needed
- Redirection of existing funds
- Other (describe):

B.4.14. What are the estimated cost and funding source(s) by fiscal year through implementation (information should be provided in the following format):

Fund Source	2009-10	2010-11	2011-12	2012-13	2013-14 and future	Total
General Fund						
Federal Fund						
Special Fund*	\$ 2,000,000					
Total	\$ 2m					

* Note: Identify the fund source and if the department is the sole user of the fund.

DWR generated funds.

Enterprise Architecture

C. Environmental & Scientific Analytics Program

C.4.1. Proposal name and priority ranking:

Environmental & Scientific Analytics Program: priority rank 5 -

C.4.2. Description of the proposed IT project:

Provide a common spatial framework and data linkages for hydrologic, economic, environmental, and water management data and studies. For example,

- Bay Delta REALM (River, Estuary, and Land Model)
- CalSim (California simulation of the hydrology and water resources system throughout the entire Central Valley)
- SIMETAW (Simulation of Evapotranspiration of Applied Water)
- BDAT (Bay/Delta and Tributaries) Cooperative Data Management System
- IEP (Inter-ecological Environmental Program)

C.4.3. Which of your department's business goals and objectives does this project support, and how?

B. Plan, design, construct, operate and maintain the State Water Project to achieve maximum flexibility, safety, and reliability.

C. Protect and improve the water resources and dependent ecosystems of statewide significances, including the Sacramento-San Joaquin Bay-Delta Estuary.

D. Protect lives and infrastructure as they relate to dams, floods, droughts, watersheds impacted by fire and disasters, and assist in other emergencies.

E. Provide policy direction and legislative guidance on water and energy issues and educate the public on the importance, hazards, and efficient use of water.

F. Support local planning and integrated regional water management through technical and financial assistance.

Development of coordinated scientific models (advanced numerical algorithms) allows the Department to:

- Evaluate the various project alternatives,(e.g., levees, storage, dams)
- Simulate the water flow through the State Water Project, for example, during a 100 year storm
- On a real-time basis, analyze the downstream impact of various water flow release rates and the current precipitation is another example.

C.4.4. What are the expected business outcomes or benefits of the proposal as they relate to your organization's business goals and objectives?

- Improved analysis of hydrologic data.
- Improved utilization of computing resources for repetitive analyses.

Enterprise Architecture

- C.4.5. The following are from the State's IT strategic plan. Check the appropriate box(s) to identify the goals this proposal supports:
- Supporting and enhancing services for Californians and businesses
 - Enhancing information and IT security
 - Reducing state operational costs (leveraging, consolidation, new technology, etc.)
 - Improving the reliability and performance of IT infrastructure
 - Enhancing human capital management
 - Supporting state and agency priorities and business direction
- C.4.6. Is the proposal consistent with your organization's Enterprise Architecture?
- Yes
 - No
- If no, please explain why the deviation from the organization's Enterprise Architecture is necessary.
- C.4.7. Will the proposed system collect, store, transmit, or exchange confidential or sensitive information?
- Yes
 - No
- C.4.8. If this proposal is conceptually approved, what is the estimated date (mm/yyyy) the FSR will be submitted?
- 01/2012
- C.4.9. What is the estimated project start date (mm/yyyy) if the FSR is approved?
- 07/2012
- C.4.10. What is the duration of the proposed project?
- Three years.
- C.4.11. Will the proposed project utilize the existing infrastructure?
- Yes
 - No
- If no, please explain.
- The project will utilize the new DWR IT infrastructure that will be in place by the end of FY 2010/2011
- C.4.12. Is the proposal related to another proposal or to an existing project?
- Yes
 - No
- If yes, describe the related proposal or project and how it is related:

Enterprise Architecture

Enterprise GIS Program -The architecture and application developed to support the GIS program should be in place so that an effective integrated graphical interface for the models can be developed.

California Water Data Management – A significant amount of the data used for the models and environmental impact analyses will import/export data from/to the water data storage system.

C.4.13. Describe the consequences of not doing this proposed project at the planned timeframe:

- Redundant and ineffective staff work
- Ineffective and incomplete projections
- Model gaps and overlap

C.4.14. Check the appropriate box(s) to identify the proposal's funding strategy:

- Augmentation needed
- Redirection of existing funds
- Other (describe):

C.4.15. What are the estimated cost and funding source(s) by fiscal year through implementation (information should be provided in the following format):

Fund Source	2009-10	2010-11	2011-12	2012-13	2013-14 and future	Total
General Fund				\$5,000,000		
Federal Fund						
Special Fund*						
Total				\$ 5m		

* Note: Identify the fund source and if the department is the sole user of the fund.

Enterprise Architecture

D. Telemetry Optimization

D.4.1. Proposal name and priority ranking:

Telemetry Optimization: priority rank 3

D.4.2. Description of the proposed IT project:

Telemetry is a technology that allows the remote measurement and reporting of information of interest to the system designer or operator.

Telemetry typically refers to wireless communications (i.e. using a radio system to implement the data link), but can also refer to data transferred over other media, such as a telephone or computer network or via an optical link.

The Department uses telemetry in a variety of applications. This project will assess the overall telemetry needs, develop a telemetry strategy that optimizes the telemetry sensor use, transmission and provides for appropriate back-up, security and disaster recovery to protect these critical assets.

D.4.3. Which of your department's business goals and objectives does this project support, and how?

E. Provide policy direction and legislative guidance on water and energy issues and educate the public on the importance, hazards, and efficient use of water.

F. Support local planning and integrated regional water management through technical and financial assistance.

The data from the telemetry devices supports model development, compliance monitoring, and planning, conservation and environmental activities.

D.4.4. What are the expected business outcomes or benefits of the proposal as they relate to your organization's business goals and objectives?

- Economies of scale
- Asset protection

D.4.5. The following are from the State's IT strategic plan. Check the appropriate box(s) to identify the goals this proposal supports:

- Supporting and enhancing services for Californians and businesses
- Enhancing information and IT security
- Reducing state operational costs (leveraging, consolidation, new technology, etc.)
- Improving the reliability and performance of IT infrastructure
- Enhancing human capital management
- Supporting state and agency priorities and business direction

Enterprise Architecture

- D.4.6. Is the proposal consistent with your organization's Enterprise Architecture?
 Yes
 No
If no, please explain why the deviation from the organization's Enterprise Architecture is necessary.
- D.4.7. Will the proposed system collect, store, transmit, or exchange confidential or sensitive information?
 Yes
 No
- D.4.8. If this proposal is conceptually approved, what is the estimated date (mm/yyyy) the FSR will be submitted?
01/2011
- D.4.9. What is the estimated project start date (mm/yyyy) if the FSR is approved?
09/2011
- D.4.10. What is the duration of the proposed project?
Two years.
- D.4.11. Will the proposed project utilize the existing infrastructure?
 Yes
 No
If no, please explain.
The DWR Telemetry Infrastructure will be redesign and implemented as part of this project.
- D.4.12. Is the proposal related to another proposal or to an existing project?
 Yes
 No
If yes, describe the related proposal or project and how it is related:
California Water Data Management: The telemetry systems are a primary source of data for the various water data information stores.
- D.4.13. Describe the consequences of not doing this proposed project at the planned timeframe:
- Data loss
 - Data redundancy

Enterprise Architecture

D.4.14. Check the appropriate box(s) to identify the proposal's funding strategy:

- Augmentation needed
- Redirection of existing funds
- Other (describe):

D.4.15. What are the estimated cost and funding source(s) by fiscal year through implementation (information should be provided in the following format):

Fund Source	2009-10	2010-11	2011-12	2012-13	2013-14 and future	Total
General Fund			\$1,500,000			
Federal Fund						
Special Fund*			\$1,500,000			
Total			\$3,000,000			

* Note: Identify the fund source and if the department is the sole user of the fund.

Enterprise Architecture

E. Water Planning Information Exchange

E.4.1. Proposal name and priority ranking:

Water Planning Information Exchange (Water PIE): priority rank 3

Description of the proposed IT project:

Lester Snow, Director of DWR, states in the foreword to the California Water Plan Update 2005, "Integrated regional water management is the future of California." The Water Planning Information Exchange (Water PIE) is the essential first step for better integrated regional water management in California.

Integrated planning brings together disparate disciplines that are not traditionally combined in the decision making process. For water management planning, integrated regional water management planning includes taking a multidisciplinary approach to evaluating alternatives and strategies; getting neighboring water utilities to cooperate and plan with one another where it is cost-effective; and getting different types of organizations with different jurisdictions to work together.

Water PIE will make sharing information easy. Water PIE is a portal for all types of water management planning information: water supplies, water use, water quality, project information and analysis, to name a few. Sharing information is the first step towards propagation of wide-spread integrated regional water management planning. Once information is shared, it can be reviewed and standardized. Once information is of good quality and comparable, analytical tools can be developed to take advantage the breadth and depth of information. Once robust analytical tools are available, and decisions can account for the complex and uncertain nature of the real world.

E.4.2. Which of your department's business goals and objectives does this project support, and how?

A. *Develop and assess strategies for managing the State's water resources, including development of the California Water Plan Update.*

The shared data in WaterPIE will play an integral role in the development of the Water Plan.

E.4.3. What are the expected business outcomes or benefits of the proposal as they relate to your organization's business goals and objectives?

- Promote integrated water management planning throughout California. People will be able to find information across geographic, institutional and subject matter boundaries. Water PIE will lead to the development of more complex and robust analytical tools to evaluate projects and plan for the future.

Enterprise Architecture

- Increase the efficiency of government staff at all levels of government. People will be able to find the water management planning information they need more quickly than they otherwise would. Water PIE will reduce institutional, financial and technical barriers to sharing water management planning information.

- E.4.4. The following are from the State's IT strategic plan. Check the appropriate box(s) to identify the goals this proposal supports:
- Supporting and enhancing services for Californians and businesses
 - Enhancing information and IT security
 - Reducing state operational costs (leveraging, consolidation, new technology, etc.)
 - Improving the reliability and performance of IT infrastructure
 - Enhancing human capital management
 - Supporting state and agency priorities and business direction
- E.4.5. Is the proposal consistent with your organization's Enterprise Architecture?
- Yes
 - No
- If no, please explain why the deviation from the organization's Enterprise Architecture is necessary.
- E.4.6. Will the proposed system collect, store, transmit, or exchange confidential or sensitive information?
- Yes
 - No
- E.4.7. If this proposal is conceptually approved, what is the estimated date (mm/yyyy) the FSR will be submitted?
- 01/2009
- E.4.8. What is the estimated project start date (mm/yyyy) if the FSR is approved?
- 09/2009
- E.4.9. What is the duration of the proposed project?
- Eight years.
- E.4.10. Will the proposed project utilize the existing infrastructure?
- Yes
 - No
- If no, please explain.

Enterprise Architecture

This project will utilize the Department's new enterprise technology architecture framework and will be used to implement a significant portion of the new architecture.

E.4.11. Is the proposal related to another proposal or to an existing project?

- Yes
- No

If yes, describe the related proposal or project and how it is related:

Enterprise GIS Program - The architecture and application developed to support the GIS program should be in place so that an effective integrated graphical interface for the models can be developed.

E.4.12. Describe the consequences of not doing this proposed project at the planned timeframe:

- Data redundancy
- Inefficient staff work
- Incomplete risk analysis
- Ineffective planning

E.4.13. Check the appropriate box(s) to identify the proposal's funding strategy:

- Augmentation needed
- Redirection of existing funds
- Other (describe):

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E.4.14. What are the estimated cost and funding source(s) by fiscal year through implementation (information should be provided in the following format):

Fund Source	2009-10	2010-11	2011-12	2012-13	2013-14 and future	Total
General Fund						
Federal Fund						
Special Fund*	\$1,766,000	\$1,321,000	\$1,140,000	\$1,247,000	\$3,730,000	\$9,204,000
Total	\$1,766,000	\$1,321,000	\$1,140,000	\$1,247,000	\$3,730,000	\$9,204,000

* Note: Identify the fund source and if the department is the sole user of the fund.

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Enterprise Architecture

A.1. Does your organization have documented Enterprise Architecture principles, strategies, or standards to guide decisions on technology projects?

- Yes
- No

A.2. Indicate on Table A-1 below, the completion status of the component Reference Models of your formal Enterprise Architecture efforts. If available, please submit a copy of your Enterprise Architecture document.

Table A-1, Enterprise Architecture Completion Status

Component Reference Model	Status			
	Implemented	Implementation in Progress	Planned or Planning in Progress	Not Implemented and Not Planned
Business		x		
Service			x	
Technical		x		
Data			x	

DWR is in the process of identifying the staffing needed of the Enterprise Architecture Branch to move forward with the development of the Department's enterprise architecture framework.

A.3. Describe the governance structure your organization uses to review and approve the Enterprise Architecture and any subsequent changes.

DWR's Enterprise Architecture Council, reviews, approves, and prioritizes enterprise architecture initiatives consistent with DWR's IT strategic plan and the Department's business goals and objectives. All Enterprise Architecture initiatives require the Enterprise Architecture Board evaluation for alignment with business priorities and approval before proceeding with the initiative.

The IT governing body for DWR is the IT Governance Committee (ITGC). The ITGC is responsible for executive-level business and IT leadership, program administration, strategic planning, policy approvals, priority of service offerings and supporting IT investments that are building out the DWR portfolio.

The DWR Enterprise Governance Board formally establishes the overall principles that serve to guide the ITGC behaviors relevant to how policies and IT decisions are made, administered, and enforced to ensure achievement of the enterprise business objectives.

These governing principles focus first on the program area lines of business, which then drive IT investment priorities. The Departments adoption and usage of governance principles positions the DWR for effective leadership, collaborative decision-making, predictable outcomes and organizational maturity.

Enterprise Architecture

A.4. Does your organization have an Enterprise Architect? (if yes, provide their name, telephone number, and e-mail address below)

Yes

No

Name: Steven M. Croft

Classification: Systems Software Specialist III (Supervisor)

Telephone Number: 916-248-8150 E-Mail: stevec@water.ca.gov

Information Security

B.1. How is your Information Security Officer involved in proposed project development efforts?

The Department's has incorporated the Questionnaire for Information Security and Privacy Components in Feasibility Study Reports (FSR) and Project-Related Documents in the project development process. The ISO is a voting member of the Information Technology Governance Committee (ITGC) that reviews and approves information technology and security initiatives.

The ISO provides information security policy, advice, and assistance for technology procurements and projects, and for IT infrastructure deployments.

Any changes to the production environment require the ISO's or designee's approval through the use of the Department's Change Control Process.

B.2. What are your department's core business principles, policies and standards related to information integrity, confidentiality, and availability and the protection of information assets?

The Department has the following policies and standards:

- *Information Security Plan* whose purpose is to preserve the integrity, confidentiality, and availability of the Department's electronic information resources, while allowing employees, consultants, and contractors to appropriately use technology to further DWR's mission. Some key component of the plan are:
 - Each individual authorized access to DWR information, systems, applications, equipment, facilities, and other information assets must follow DWR information security policies and good business practices to protect those assets from unauthorized access, use, modification, deletion, destruction or disclosure.
 - Each DWR employee must help prevent, detect, report, and minimize compromise to any information asset.
 - DWR employees must help preserve business continuity, protect the health and safety of customers and staff during a disruption and following a disruption carries out their duties to assist with the rapid prioritized restoration of services.
 - The DWR ISP is based on the ISO -27001 standards and is supplemented with a number of subject specific standards and processes, including but not limited to, Employee Internet/Electronic Mail Use, Employee Security Awareness, Mobile Computing Encryption, Remote Access, and Virtual Private Network (VPN) Access policies.
- *External Access Policy* which addresses strong security at the server or host level and limits external access into the Department's internal network by means of a firewall and direct dial-up security.
- *Computer Security Standard Operating Procedures* concentrate on password standards, employee and contractor responsibilities, privacy and appropriate use, sensitive or confidential data, incident reporting, etc.

Information Security

B.3. If data within your department is shared with external entities, does your department implement data exchange agreements with these entities?

- Yes
- No

If no, please explain.

Not applicable

B.4. How does your department ensure that software developers and programmers follow standards and best practices for Web, application, and system development?

- Standardized database and development tools
- Documented development standards and guidelines
- Design, Presentation, and code reviews
- Centralization of data and database administration
- Enterprise and Application Architecture approval
- The Department is implementing vulnerability checking software for our web applications.
- The Department has implemented a server configuration vulnerability scanning program.

B.5. Does your organization have an Information Security Officer? (if yes, provide their name, telephone number, and e-mail address below)

- Yes
- No

Name: Tony Lourick

Classification: DPM III

Telephone Number: (916) 653-2137 **E-Mail:** Tony.Lourick@water.ca.gov

Workforce Development, Workforce Planning and Succession Planning

C.1. Does your organization have a workforce development plan for IT staff?

- Yes
 No

If yes, briefly describe it.

The current annual appraisal and development process considers individual staff training and development. However, in the coming year, the Division of Technology Services will be initiating a more holistic training and development curriculum.

C.2. Check the appropriate box(s) to identify which workforce development tools, if any, your organization is using for IT classifications:

- Training
 Upward Mobility
 Mentoring
 Career Assessments
 Knowledge transfer program
 Performance Evaluations
 Other (please list)

C.3. Does your organization have a workforce plan for IT staff (i.e., for Rank and File)?

- Yes
 No

If yes, briefly describe it.

The Department of Water Resources has established a DWR Succession/Workforce Planning Design team that is looking into workforce and succession planning issues enterprise-wide.

C.4. Does your organization have a succession plan for IT staff (i.e., for Management)?

- Yes
 No

If yes, briefly describe it.

The purpose of the Department of Water Resources, Division of Technology Services' (DTS) Succession Leadership Plan (SLP) is to clearly identify and document the methodology, approach, and processes to be followed in order to execute its Succession Leadership Strategy. Succession planning is critical because it often takes years of grooming to develop effective senior level managers and technical experts. The SLP will help Division leaders identify the required skills, potential talent and supplemental training and mentoring options needed to efficiently and effectively fill key leadership positions as they are vacated. Training, mentoring, evaluating and recruiting processes will be on-going activities.

Workforce Development, Workforce Planning and Succession Planning

C.5. IT Staffing

Provide the following information in table C-1 on the following page:

- **The name of each IT classification currently in the organization.**
- **The number of staff in each IT classification in the organization.**
- **The number of staff in each IT classification eligible to retire in the next five years.**
- **The percentage of each IT classification eligible to retire in the next five years.**

Table C-1 — IT Staffing

IT Rank and File Staff Classification	Number of IT Rank and File Staff in Classification	Number of IT Rank and File Staff in Classification Eligible to Retire in Next 5 Years	IT Management Staff Classification	Number of IT Management Staff in Classification	Number of IT Management Staff in Classification Eligible to Retire in Next 5 Years
Associate Information Systems Analyst, Specialist	20		Data Processing Manager II	2	1
Associate Programmer Analyst, Specialist	6		Data Processing Manager III	6	6
Assistant Information Systems Analyst, Specialist	9		Data Processing Manager IV	2	2
Computer Operator	1		Senior Information Systems Analyst, Supervisor	4	4
Control Systems Technician I	1		Senior Programmer Analyst, Supervisor	3	1
Information Systems Technician	2		Systems Software Specialist III, Supervisor	8	4
Programmer II	3				
Senior Information Systems Analyst, Specialist	8				
Senior Programmer Analyst, Specialist	4				
Staff Information Systems Analyst, Specialist	72				

IT Rank and File Staff Classification	Number of IT Rank and File Staff in Classification	Number of IT Rank and File Staff in Classification Eligible to Retire in Next 5 Years	IT Management Staff Classification	Number of IT Management Staff in Classification	Number of IT Management Staff in Classification Eligible to Retire in Next 5 Years
Staff Programmer Analyst, Specialist	8				
System Software Specialist I, Technical	5				
System Software Specialist II, Technical	15				
System Software Specialist III, Technical	1				
TOTAL:	155	63		25	18

Project Management, Portfolio Management and IT Governance

D.1. Does your organization have a process for improving the alignment of business and technology?

- Yes
 No

If yes, briefly describe it.

DWR's Enterprise Governance Board, reviews, approves/denies, and prioritizes enterprise projects based on their consistent with DWR's strategic business goals and objectives. All enterprise projects require the Governance Board evaluation for alignment with business priorities and approval before proceeding as a formally authorized project. The Governance Board includes Executive level representation from all DWR lines of business.

D.2. What is the status of implementing a formal portfolio management methodology for technology projects within your organization?

- Implemented (Please describe)
 Implementation in progress (Please describe)
 Planned or planning in progress
 Not implemented and not planned

D.3. List any automated tools being used for portfolio management. Enter "None" if no automated tools are being used.

None

D.4. What is the status of implementing a standard project management methodology for technology projects in your organization?

- Implemented (Please describe)
 DWR's IT Project Management Methodology (ITPMM) is based on Project Management Body of Knowledge and the Office of Chief Information Officer's Project Management Oversight Framework.
- Implementation in progress (Please describe)
 Planned or planning in progress
 Not implemented and not planned

D.5. Does the organization require its project managers to be certified, either through a professional organization (e.g., PMI, ITIL) and/or through completion of specified project management coursework:

- Yes
 PMI
 ITIL
 Agency-specified project management coursework (identify below)

No

All project managers leading IT projects are trained in project management practices and methodologies but are not required to be certified or to complete a formal certification program in part, due to availability and/or limitations of training funds. DWR future direction is to require PM certification as we mature our PMO.

D.6. Select from the list other areas of training your organization requires of its project managers:

- Fundamental Project Management
 Systems Development Life Cycle

Project Management, Portfolio Management and IT Governance **Scheduling tool (identify below)**

-

-

-

 Project Performance Management (e.g., Earned Value Management) **Business Process Analysis** **Requirements Traceability** **Procurement/Contracts Management** **Other (identify below)**

-

-

 None**D.7. Describe project-level governance practices, including change management, issue resolution, and problem escalation.**

All IT projects, including change management, issue resolution processes and problem escalation processes are part of DWR's project management methodology and governance. All change management requests impacting the project scope, business objectives, schedule, and budget must be approved by the designated sponsor before the change is accepted and implemented. DWR documents project issues and risks for all projects and continuously monitors, resolves and report issues and risks throughout the project. Problems are first evaluated by the project manager and escalated as needed. Further escalation path would be to the business owner and project sponsor for direction and/or decision.

Projects develop, document, and manage configuration management (including change management), risk, and issue resolution processes. Generally, weekly or bi-weekly meetings are held to review items. Issue owners are responsible for timely resolution. However, if a project is unable to resolve an issue at the project-level, it is elevated to its Steering Committee for resolution. IT project managers collaborate through regular meetings to leverage the work of others and to identify any enterprise level issues and risks.

DWR projects have an Executive Sponsor and executive level Steering Committee comprised of Division Chief and/or Branch Deputy Directors who provide guidance to projects. Projects hold monthly Steering Committee meetings.

D.8. Does the project management methodology include processes for documenting lessons-learned and applying these to future projects? **Yes (Please describe)**

Documentation of lessons learned is incorporated into DWR's project management methodology. Lessons learned are captured throughout a given project as well as part of the formal project closeout processes and deliverables. The project management methodology is continuously re-evaluated and updated based on lessons learned from prior projects as well as current projects.

 No