

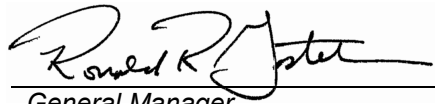
Staff Recommendation

Option 1.



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Acting Manager, Corporate Resources

11/19/99
Date



Ronald R. Jester
General Manager

11/22/99
Date

Attachment 1 - (Detailed Description)

Attachment 2 - (Cost Analysis)

Attachment 3 - (Location Map)

Detailed Report

Scope. Metropolitan is required to semi-annually monitor existing dams and provide reports to the California Division of Safety of Dams (DSOD). New dams, such as those at the Eastside Reservoir, require more frequent monitoring until the reservoir has been completely filled. Each facility has a series of monuments placed on or adjacent to the dam that must be carefully surveyed to measure any movement of the dam structure. Approximately 4,000 measurements per year must be taken during the initial fill of the reservoir to adequately monitor deformation.

Requirement. The West Dam, Forebay, Saddle Dam, East Dam and Goodhart Canyon Detention Basin must be monitored on a monthly basis during the initial filling of the reservoir. After the reservoir has been completely filled, monitoring will be reduced to a quarterly basis for about 18 months, and then continue semi-annually for the life of the facility. However, monitoring must be in accordance with the state-approved monitoring program, which is subject to revision at any time.

Alternatives.

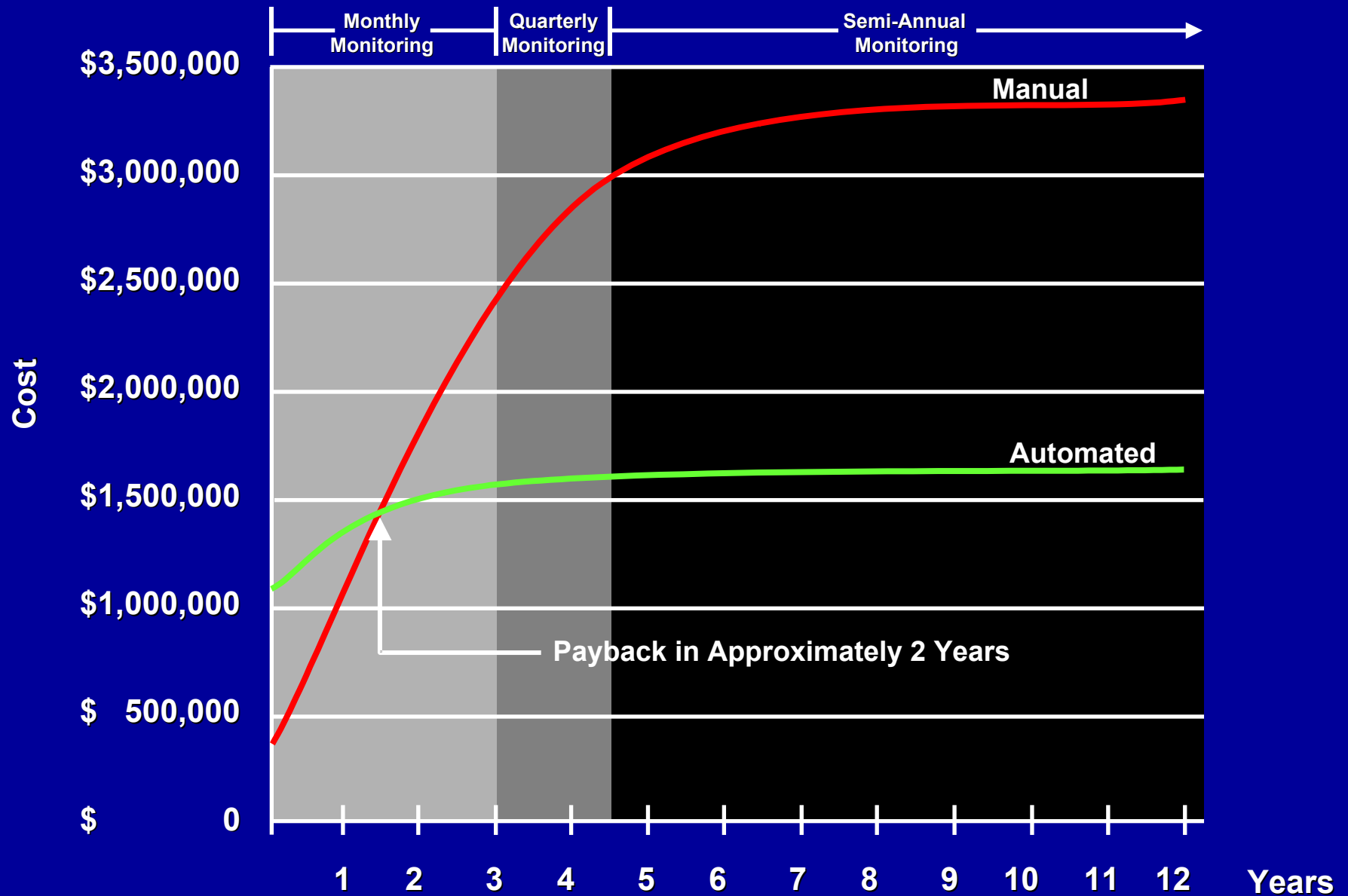
Option #1 - Automated Dam Deformation Monitoring System

This option would utilize eight permanently mounted survey instruments, enclosed in small shelters, to collect the required deformation data. The survey instruments would automatically measure angles and distances to reflecting prisms mounted on 240 deformation monuments. The measurements would be downloaded to a data collector and transferred via a radio-based communication system to the survey office in Glendora where the data would be analyzed. A solar power system would be used to provide electrical power to the survey instruments, data collectors, and radio system. Spectria was the successful respondent to a Request for Proposals to design and construct the data communication and solar power system. The eight survey instruments and 240 reflecting prisms would be competitively procured via a purchase requisition. The initial cost for the survey instruments, analysis software, reflecting prisms, shelters, deformation monuments, radio system and solar power system is approximately \$1,153,000. Long-term cost, including labor, for the first 12 years of operation is approximately \$1,500,000. This option has the lowest long-term cost and minimizes staffing requirements to collect the required deformation data. In addition, the automated system can provide continuous, real time, remote monitoring of dam deformation, if required.

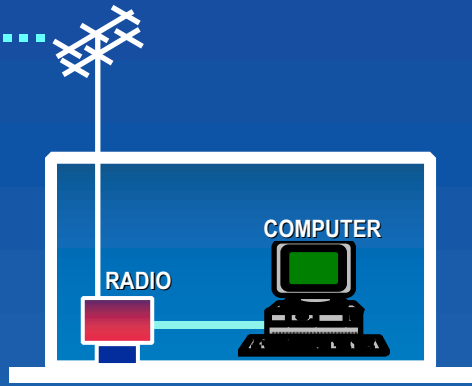
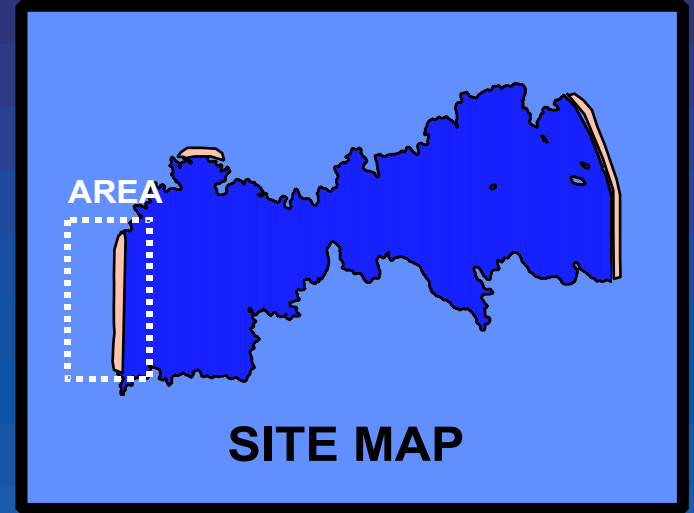
Option #2 - Use Traditional, Manual Methods to Collect the Required Deformation Data

The option would utilize survey crews to manually collect deformation data. The crews would be dispatched from the survey office in Glendora, drive to each of the five Eastside Reservoir facilities, collect the data using traditional, manual methods, and then drive back to Glendora where the data would be analyzed. This option is labor intensive and would require additional staff. Six additional employees would be needed to collect deformation data during the initial fill period when monthly monitoring is required. The initial cost for survey equipment for the additional crews, data analysis software, and deformation monuments is approximately \$352,000. Long-term cost, including labor, for the first 12 years of operation is approximately \$3,417,000. This approach minimizes initial costs, but more than doubles long-term costs. Moreover, it does not provide continuous, real-time monitoring of dam deformation.

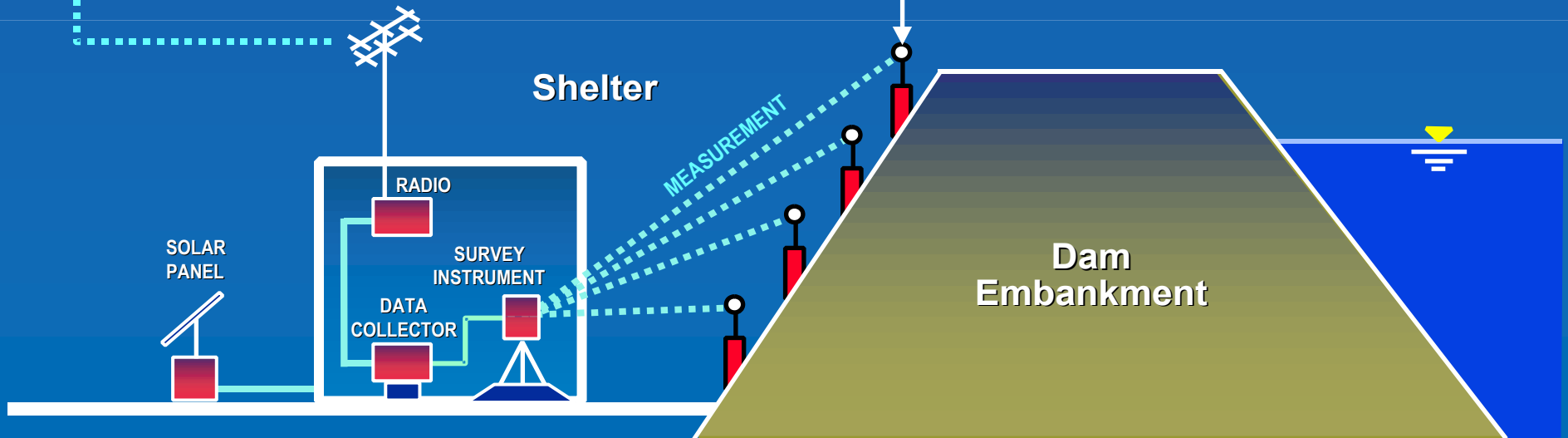
ESRP Automated Monitoring System Cost Analysis - 36 Month Fill



ESRP Dam Deformation Monitoring



Glendora Survey Office



Monuments with Reflecting Prism

Shelter

Dam Embankment

Not To Scale