EXHIBIT 4-A

Monterey Peninsula Water Management District

Sand City Desalination Project Feasibility Study Executive Summary

March 25, 2004

Executive Summary

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Introduction and Background

Camp Dresser & McKee Inc. (CDM) is providing technical support to the Monterey Peninsula Water Management District (District) and Jones & Stokes Associates (JSA) for the Monterey Peninsula Water Supply Project. This Phase 2 report presents the results of CDM's feasibility evaluation of the desalination plant in Sand City to assist in development of the final project alternatives for seawater collection and brine disposal. This information will be used for the development of the EIR that JSA is preparing, and is in accordance with CDM's authorized Phase 2 scope of services. The report incorporates District staff and peer review comments on CDM's Draft Report dated February 27, 2004.

In Phase 1, CDM developed preliminary yield estimates and project layouts for a desalination plant that would use either radial wells along the beach in Sand City, or horizontal directionally drilled wells that would extend off-shore, for seawater collection. Phase 1 yield estimates were based on both regional information and field data from early 1990's investigations for a smaller desalination plant. The smaller plant covered a limited area adjacent to the former Seaside wastewater treatment plant. The Phase 1 estimates assumed similar hydrogeologic conditions existed within the defined project area (both collection and disposal areas). Because of the uncertainty associated with this assumption, and corresponding lack of detailed data along the coastline, CDM recommended that more extensive on-shore and off-shore investigations be conducted to better define subsurface conditions.

As part of the Phase 2 effort, and in parallel with the EIR preparation, CDM was tasked with conducting detailed land-based and marine geological investigations along the approximately 4-mile length of shoreline from the City of Seaside to the former Fort Ord Military Reservation (Fort Ord). The work conducted during this investigation was performed to further evaluate project feasibility; to assist in development of the final project alternatives for seawater collection and brine disposal; and provide support for the development of the EIR.

The primary objectives of the feasibility study were threefold: 1) delineate and characterize the hydrogeologic characteristics of the shallow dune/beach sand aquifer along a narrow approximately 4-mile long section of shoreline extending from the City of Seaside to former Fort Ord; 2) evaluate the feasibility of horizontal directionally-drilled (HDD) seawater collector and brine disposal well technology; and 3) integrate the investigation results into the project's numeric groundwater model that has been developed to estimate system yields and aquifer response using either HDD or radial well collectors.

Project Description

The Monterey Peninsula Water Supply Project was proposed in mid-2003 to include either an array of the HDD or radial collector wells for seawater collection (feedwater source) located along the coastal beachfront of Sand City (CDM, 2003). A brine disposal system would use either HDD or radial wells at Ford Ord, or a pipeline to the Monterey Regional Water Pollution Control Agency's wastewater treatment plant facility at Marina (regional outfall). The project goal is to produce 8,400 acre-feet/year (AFY) of treated (potable) water. The proposed plant would be a reverse osmosis (RO) treatment plant, taking 15 million gallons per day (MGD) of groundwater (feedwater) and producing 7.5 MGD (8,400 AFY) potable water based on a 50 percent RO plant efficiency.

In an effort to minimize environmental impacts and maximize seawater collection, the draft EIR evaluated offshore HDD and radial collector well options in detail. An option to drill an onshore HDD well, that was developed as a modified concept using HDD technology, was examined in the draft EIR, but was not evaluated in detail.

Findings and Project Implications

Based on the findings of this investigation, it is CDM's opinion that the shallow dune/beach aquifer desalination project as defined in CDM's draft Monterey Peninsula Water Supply Project Technical Memorandum (CDM, 2003b) is feasible using radial well collectors, or a modified alternative to the initially conceptualized HDD configuration. These facilities would be constructed in the Sand City area. System redundancy to provide water supply during scheduled or unscheduled operation would require additional system components (e.g., collector intakes) to ensure operational reliability. The preferred siting locations of these intakes would be at Fort Ord. Disposal of brine at the regional outfall is the best option, as injection of brine at Fort Ord may not be feasible due to potential impacts to local groundwater drinking water supplies and the likely addition of intake collectors to meet service reliability needs or increased system yields.

Previous analyses conducted by various investigators were based on the assumption that the geologic conditions (conceptual model) were consistent along the entire shoreline and near shore project area. Based on the findings of this investigation, this assumption is not accurate. Investigation results have changed our understanding of the hydrogeologic conditions, and will affect the project configuration. The key findings include:

- The onshore hydrogeologic sequence does not extend significantly offshore due to erosion and deposition of poorly consolidated marine sediments. This results in reduced capability to extend offshore HDD collector/disposal screens significant distances offshore due to the high probability of mud loss (frac-out) into Monterey Bay during drilling.

- The submerged seabed slope is steeper than originally interpreted, resulting in a reduced offshore coastal aquifer system to collect or dispose of water.

- Seaside Clay does not act as a regional aquiclude separating the coastal aquifer from underlying drinking water aquifers in the northern Fort Ord area, resulting in direct communication between the upper saline coastal aquifer and lower drinking water aquifer. This finding eliminates the alternative of using disposal of brine at former Fort Ord, but creates an opportunity to expand project yield by through the addition of radial collectors into the area. The most viable brine disposal option is considered the outfall at the regional wastewater treatment facility.

The following table summarizes the seawater intake feasibility, predicted water supply yields based on numeric modeling, and comments presenting relevant information for each intake collector option evaluated. The findings and implications relevant to brine disposal options follow this table.

Table E-1
Summary of Seawater Collector Feasibility Evaluation and Findings

Collector Method Evaluated	*Feasibility?*	*Meets Project Groundwater Supply Yield* [(1)]	*Numeric Model Collector Yield*	*Comments*
HDD – Offshore	Infeasible	- -	- -	No further consideration.
HDD – Onshore	Feasible	Yes	15 MGD (16,800 AFY) (8,400 AFY Potable Yield)	Augment single collector system with similar HDD or radial collector system to the north at Sand City/Fort Ord to provide needed system redundancy.
Radial Collector Options				
3 wells	Feasible	No	7 MGD (7,800 AFY) (3,900 AFY Potable Yield)	Augment with two to four additional wells Sand City/Fort Ord to achieve project yield and provide needed system redundancy
4 wells	Feasible	No	10 MGD (11,200 AFY) (5,600 AFY Potable Yield)	Augment with two to three additional wells Sand City/Fort Ord to achieve project yield and provide needed system redundancy

(1) A supply capacity of 15 MGD can provide an annual supply of 16,800 AFY to the desalination plant. This will provide an annual treated water supply of 7.5 MGD (8,400 AFY) based on assumed 50% desalination treatment plant efficiency.

Numeric modeling indicates that operation of either the radial collector wells, or onshore HDD system collection system will significantly impact the proposed collector system for the Sand City desalination plant. Impacts resulting from operation of the District's project to the nearby desalination project collector system include: a significant lowering of groundwater elevations up to an inland distance of approximate 1,500 feet, and capture of brine discharge from the adjacent Sand City system, which will reduce intake water quality and lower system efficiency.

Disposal of brine at the former Fort Ord Military Reserve is not considered operationally feasible, as the brine concentrate would impact water quality of the lower drinking water aquifer. Therefore, brine disposal is proposed to be limited to the outfall located at the regional wastewater treatment outfall located in Marina. While not an optimal situation, this circumstance provides the District with a potential opportunity to increase project collector yield through the addition of seawater collection intakes north along the coast on former Fort Ord.

This report documents the findings of our investigation and modeling and presents the findings of CDM's feasibility study that will be used to develop final project EIR alternatives for seawater collection and brine disposal.