

DWR WAREHOUSE

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I. EXECUTIVE SUMMARY**SELENIUM REMOVAL
PANOCHÉ DRAINAGE DISTRICT
TILE DRAINAGE WATER****By
H.P.T. RESEARCH, INC.**

This proposal represents H.P.T. Research, Inc. technology to remediate the selenium contamination of the tile drainage water at Panoche Drainage District. H.P.T. has successfully performed bench scale tests for the removal of selenium from tile drainage water at Panoche Drainage District.

H.P.T. will design, reconstruct and operate a pilot treatment system with 5-15+ gallons per minute treatment. The process will remove selenium to below maximum contaminant levels for drinking water standards. The project will demonstrate a new treatment process for selenium laden water that is entering the San Joaquin River and the Bay-Delta Region. The reduction of selenium in this Region will improve the water quality.

CALFED has identified water quality in the San Joaquin River and Bay-Delta Region as a primary stressor on fish, wildlife and humans.

The project will cost \$ 512,500 for H.P.T. Research, Inc. to design, reconstruct and operate the system for 15 months.

H.P.T. has successfully been conducting research and development in water treatment processes for more than 5 years. H.P.T. has successfully performed bench tests on Panoche Drainage District, tile drainage water, removing selenium to below 4 ug/l. The project will have to be continuously monitored and tested by H.P.T., Panoche Drainage District and B.S.K. Laboratories.

Data evaluation will be performed by H.P.T., Panoche and B.S.K. Laboratories. All regulatory agencies will receive copies of reports and test results.

This project is supported by Panoche Drainage District and will serve to identify a new technology for a water problem that has been identified for many years. The treatment system has demonstrated remediation of selenium not previously attainable.

CALFED has identified selenium as a primary stressor in water quality in the San Joaquin River and Bay-Delta Region

**SELENIUM REMOVAL
PANOCHÉ DRAINAGE DISTRICT**

Proposed by

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In Collaboration with
PANOCHÉ DRAINAGE DISTRICT

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III. Project Description

A. Project Description and Approach

The H.P.T. Treatment project will set-up a portable treatment system at drainage sump #25. The H.P.T. Treatment process utilizes a patented technology to oxidize the selenium and precipitate it. H.P.T has successfully treated drainage water from sump #25 in numerous bench tests.

B. Location and/or Geographic Boundaries of Project

The project will be operated in the lower San Joaquin River watershed in Western Fresno County, approximately 10 miles west of Firebaugh, CA on Nees Avenue along the Northside drain. (T12S.R12E Sections 26 and 27). Panoche Drainage District's drain water currently is discharged through District delivery channels north through the Grassland Bypass Project into Mud and Salt Slough and then the San Joaquin River.

C. Expected Benefits

The primary stressor addressed by the project is contaminants entering the lower San Joaquin River by way of subsurface agricultural drainage water. Species and species groups benefiting from reductions in contaminants entering the Bay-Delta include delta smelt, longfin smelt, splittail, white and green sturgeon, striped bass, marine and estuary fishes, large invertebrates, Bay-Delta aquatic foodweb organisms and waterfowl.

The specific problem to be addressed by the project is the Selenium (Se) concentrations in drainage water which enters the San Joaquin River via discharges from the Panoche Drainage District (PDD).

The result of the reduction in Se loading and reduction in TDS will be an improvement in the water quality for agricultural, municipal, industrial and recreational beneficial uses and a reduction in danger to various Bay-Delta species, shore and wading birds in particular.

Any improvement in water quality to the San Joaquin River and, ultimately the Bay-Delta, benefits all stakeholders.

D. Background and Biological/Technical Justification

The Drainage District (PDD) covers a service area of 44,000 acres in western Fresno County along the Interstate 5 corridor. Within the PDD boundaries are 38 miles of open drains which move seepage water and developed tile drainage water from irrigated land. These tile drains are necessary to keep boron and high concentrations of salts from lodging in the root zone of agricultural crops and killing the plants. As the shallow underground aquifer develops, it picks up naturally occurring Se from the soil profile,

concentrating it in the drainage water. PDD must find a way to reduce Se load in its drainage water in order to maintain water quality standards in the San Joaquin River while maintaining a viable drainage outlet for part of California's valuable agricultural industry.

E. Proposed Scope of Work

H.P.T. and Panoche Drainage District propose to design, re-construct and operate a pilot treatment system to remove selenium from the tile drainage water in the Panoche Drainage District. The pilot treatment system will treat 5-15+ gallons per minute.

H.P.T. has successfully demonstrated bench scale tests that remove selenium from the tile drainage water to less than 4ug/l. H.P.T. has a portable treatment system that can be modified to demonstrate these results.

Phase 1

H.P.T. will design and modify their existing treatment system to treat the tile drainage water from drainage sump (DP-25). H.P.T. expects the design, re-construction and set-up of the portable treatment system to take 1 month. A report will detail the progress of this phase.

Phase 2

H.P.T. will initialize the treatment project and perform tests to adjust the system to maximize the treatment system output. H.P.T. expects that Phase 2 will take 1 month. A report will detail the start-up and tests results.

Phase 3

H.P.T. will operate the treatment system demonstrating selenium removal. This phase will last 5 months. A monthly report will detail the operations and test results.

Phase 4

H.P.T. will operate the treatment system with additions to the treatment process to reduce the Boron and chloride levels, along with Selenium removal, from the tile drainage water. This phase will last 5 months.

F. Monitoring and Data Evaluation

During the project, the laboratory tests will be performed by BSK Analytical Laboratories.

H.P.T. proposes to monitor the treatment system by pulling grab samples as follows:

Month 1

Raw samples at system start-up (daily)
Treated samples every 2 hours of operation

Month 2 and 3

Raw sample at system start-up (daily)
Treated sample at noon and end of day

Month 4

Raw sample at system start-up (daily)
Treated sample at end of day

Month 5

Raw sample at system start-up (M,W,F)
Treated sample at end of day (M,W,F)

Month 6

Raw sample at system start-up (T,F)
Treated sample at end of day (T,F)

Month 7 thru 12

Raw sample at system start-up (W)
Treated sample at end of day (W)

The outside laboratory testing will be performed by BSK Analytical Laboratories. H.P.T. will draft a Q.A.P.P. as part of the project. The Q.A.P.P. will incorporate the Q.A.P.P. of BSK Laboratories. The project will demonstrate a new way to remove selenium from water. The test results will be available for review by any interested party.

G. Implementability

H.P.T. anticipates that the project will be in compliance with all laws and regulations. The project takes a hazardous discharge and produces non-hazardous by-products and dischargable water. Panoche Drainage District has given H.P.T. permission to conduct this project. H.P.T. believes that upon the successful completion of this project publishing of the results, considerable support will be shown for treatment program for the San Joaquin river and Bay-Delta Region.

The proposed project will be operated in accordance with all applicable laws and regulations. Access has been granted and allowed by landowners in the area and no changes to land or water conveyances are necessary to implement the project.

IV. COSTS AND SCHEDULE TO IMPLEMENT PROPOSED PROJECT

A. Budget Costs

PHASE 1

Design & reconstruction of existing treatment system

Direct Labor	\$ 20,000
Overhead	10,000
Materials & Acquisition	28,000
Misc.	<u>2,000</u>
Total Cost Phase 1	\$ 60,000

PHASE 2

Direct Labor	\$ 30,000
Overhead	15,000
Service Contracts (testing & equipment rental)	6,000
Materials & Acquisition	52,000
Misc.	<u>5,000</u>
Total Cost Phase 2	\$108,000

PHASE 3

Direct Labor	\$ 61,000
Overhead	30,500
Service Contracts (testing & equipment rental)	56,000
Misc.	<u>10,000</u>
Total Cost Phase 3	\$157,500

PHASE 4

Direct Labor	\$ 61,000
Overhead	30,500
Service Contracts (testing & equipment rental)	64,200

Materials & Acquisition	21,000
Misc.	<u>10,000</u>
Total Cost Phase 4	\$186,700

TOTAL PROJECT COST \$512,200

B. Schedule Milestones

Work on Task 1 would begin upon approval and final signatures of the CALFED contract with Panoche Drainage District. The other tasks, and the corresponding payments from CALFED, would follow according to the schedule listed below. The dates listed below are assuming a start date of November 1, 1997. If the start date is different, the same intervals of completion will apply.

<u>Task</u>	<u>Completion Date</u>	<u>Payment Amount</u>
1	Dec. 1, 1997	\$ 60,000
2	Jan 1, 1998	108,000
3	June 1, 1998	157,500
4	Oct. 31, 1998	186,700

C. Third Party Impacts

No third parties will be negatively impacted as a result of any operations involved with this project.

H.P.T. Research, Inc. has been successful in doing research and development for water treatment systems for more than 5 years. H.P.T. has successfully performed bench tests on Panoche Drainage District water numerous times.

H.P.T. is a private corporation. H.P.T. will have the following personnel involved in the project.

J. Michael Overton, Senior Scientific Investigator:

Mike attended California State University, Chico with a major in Industrial Arts. This was followed with certificates in Industrial Machining , a Secondary Teaching Credential, Gunsmithing and teaching over 10 years at the college level, Mike has successfully owned and operated an industrial machine company for 28 years specializing in helicopter parts and tools, underground boring equipment and prototype manufacturing for the farming, food service and construction industries.

His early interest in magnetics and his initial research regarding magnetic field influence on various types of fluids lead to the development of a unique single pole magnet. Mike has steadfastly pursued H.P.T. research and development during the past 10 years with 3 US Patents, 11 Patents Pending and numerous other applications to be filed shortly.

S.R. Wurzbarger, Senior Scientific Investigator:

Following college with a degree in General Education and Earth Sciences, Steve served 2 tours of duty in Vietnam in the communications and electronics fields. He then attended college with degrees in Electronics and Law Enforcement. For several years he was employed in the thermal energy and natural gas production industries for a major California public utility.

For the past 20 years he has been closely associated with the Western mining industry working in a variety of positions including underground mining, Placer mining, geological surveying and design and construction of mineral recovery systems.

Steve has pursued H.P.T. research and development for the past 10 years with 3 US Patents, 11 Patents Pending and numerous other applications to be filed shortly.

David C. Triplett, Jr., Administration

David is a Vietnam veteran with more than 5 years of college. David has been involved with the environmental field for more than 25 years. He has been doing environmental compliance and entitlement throughout California.

For the past 20 years, David has served as an executive and owner for companies developing more than 25,000 units of residential housing units and more than 1000 acres of commercial or industrial development. David was the executive in charge of directing the environmental planning, compliance, development and construction.

Tim Hoel, ClearWater Systems:

Tim has over 30 years experience in the chemical specialty industry. Following college he immediately started selling industrial chemical specialty products. He has held positions in sales, marketing, management, chemical formulation and manufacturing and has successfully owned and operated his own business.

Since 1985 he has been primarily involved in the manufacturing and sales of chemical and mechanical equipment to the industrial wastewater treatment

industry. With a knowledge of chemical precipitation chemistry utilizing polymer flocculation of waste stream contaminants, Tim designed a unique Clarification, Recycling and Sludge Management System (ClearWater Systems) for the small to medium industrial waste stream generator. ClearWater Systems, a division of H.P.T. Research, Inc. currently manufactures in Rancho Cordova, CA.

NONDISCRIMINATION COMPLIANCE STATEMENT

COMPANY NAME

HPT RESEARCH, INC

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME

DAVID C. TRIPLETT, JR

DATE EXECUTED

7/28/97

EXECUTED IN THE COUNTY OF

NEVADA

PROSPECTIVE CONTRACTOR'S SIGNATURE

[Handwritten Signature]

PROSPECTIVE CONTRACTOR'S TITLE

CORP SEC

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

HPT RESEARCH, INC