

National Aeronautics and  
Space Administration  
Office of Space Science

NASA Management Office

180-801  
Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, CA 91109-8089

Reply to Attn of:

SJ

FOOTHILL MUNICIPAL  
WATER DISTRICT

JAN 30 2004

RECEIVED



RECEIVED  
JAN 30 2004

January 27, 2004

Mr. Tony Zampielo  
Raymond Basin Management Board  
4536 Hampton Road  
La Canada Flintridge, California 91012

**REINJECTION OF TREATED WATER ASSOCIATED WITH THE  
OPERABLE UNIT 1 EXPANDED TREATABILITY STUDY**

Dear Mr. Zampielo:

This letter is intended to notify the Raymond Basin Management Board (RBMB) of the National Aeronautics and Space Administration's (NASA) proposal to install and operate a groundwater extraction, aboveground treatment, and reinjection system at NASA's Jet Propulsion Laboratory (JPL). Remediation activities at NASA JPL are being conducted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The groundwater treatment system, also referred to as the expanded treatability study (ETS), is planned to support development of a full-scale remedial action to address chemicals of interest in NASA's JPL Operable Unit 1 (OU-1), on-facility groundwater. NASA is conducting on-going remedy selection and cleanup activities with input from the U.S. Environmental Protection Agency (EPA), California Department of Toxic Substances Control (DTSC), and the Los Angeles Regional Water Quality Control Board (RWQCB). You were provided copies of this OU-1 ETS, and technical briefings were given at the November Remedial Project Manager meeting.

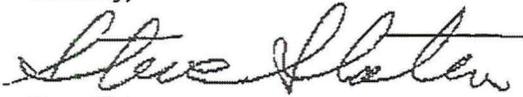
As part of the OU-1 ETS, a 250-gallon per minute [approximately 403 acre feet/year (af/y)] groundwater treatment system will be installed in the north-central part of the JPL campus. The ETS is designed to extract groundwater from the area of the aquifer with the highest chemical concentrations. System installation is scheduled to begin during February 2004 with full-scale operation scheduled to begin during July 2004. The primary components of the treatment system are two granular activated carbon (GAC) units to remove chlorinated volatile organic compounds (VOCs), a fluidized bed reactor (FBR) to remove perchlorate, and a multimedia filter to remove suspended solids prior to reinjection.

NASA understands that the RBMB oversees implementation of the adjudication provisions of the Raymond Basin Judgment. Since NASA has no adjudicated groundwater allocation from the Raymond Basin, the extracted groundwater will be treated and reinjected into the same aquifer. As part of the OU-1 ETS system operation, less than 2 af/y year of backwash wastewater generated from the treatment system is proposed for sanitary sewer discharge. Therefore, this approximate volume of extracted water will not be returned to the aquifer.

If you have objections to this OU-1 ETS, please notify me by February 6, 2004. Upon initiating operation of the system, NASA will provide quarterly updates to the RBMB that will include actual volumes of groundwater that is extracted, reinjected, and disposed as waste.

Thank you for your consideration of this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Slaten". The signature is fluid and cursive, with a horizontal line drawn across the top of the letters.

Steve Slaten  
NASA-JPL Remediation Project Manager

cc:  
DTSC/Mr. Iskarous  
EPA/Mr. Ripperda  
Regional Water Quality Control Board/Mr. Zaidi



## RAYMOND BASIN MANAGEMENT BOARD

4536 HAMPTON ROAD, P.O. BOX 686, LA CAÑADA FLINTRIDGE, CA 91012-0686 (818) 790-4036 FAX (818) 790-9418

February 18, 2004

City of Alhambra

City of Arcadia

California-American  
Water Company

East Pasadena  
Water Company

H.E. Huntington Library  
and Art Gallery

Kinneloa Irrigation  
District

La Cañada Irrigation  
District

Las Flores Water Company

Lincoln Avenue  
Water Company

Pasadena Cemetery  
Association

City of Pasadena

Rubio Cañon Land and  
Water Association

San Gabriel County  
Water District

City of Sierra Madre

Sunny Slope  
Water Company

Valley Water Company

Mr. Steve Slaten  
NASA-JPL Remediation Project Manager  
NASA Management Office  
180-801  
Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, CA 91109-8099

### RE: Proposed Groundwater Treatment

Dear Mr. Slaten:

This office represents the Raymond Basin Management Board ("Board"), which was formed by the Los Angeles County Superior Court when it adjudicated the Raymond Groundwater Basin in *The City of Pasadena v. City of Alhambra* (Los Angeles County Superior Court, Case No. Pasadena C-1323.) The court has charged the Board with the powers and responsibilities of managing the Raymond Basin and to protect the long-term quantity and quality of the groundwater supply. The Board is presently composed of members from the City of Pasadena, the Lincoln Avenue Mutual Water Company, Rubio Canon Land and Water, the City of Alhambra, the City of Arcadia, California-American Water, Kinneloa Irrigation District, San Gabriel County Water District, City of Sierra Madre and Sunny Slope Water Company.

Thank you for your letter of January 27, 2004, concerning your plans to implement a groundwater cleanup program in the Basin. The Board will provide whatever assistance it can to ensure the program is implemented expeditiously. However, the Board has the following comments concerning your proposal:

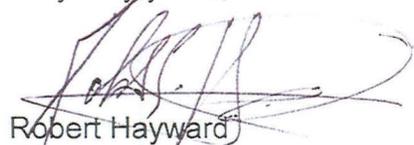
1. Since JPL plans to extract water from the Basin, how will JPL replenish the basin to cover water lost in the process? The Board has recently met to discuss this issue. The City of Pasadena has expressed an interest in facilitating JPL in the replenishment of the basin to cover water not re-injected.

2. Please provide formal documentation to the board that your proposed cleanup project at OU-1 is in full compliance with all legal and regulatory requirements of the Regional Water Control Board, the Department of Health Services, the U.S. Environmental Protection Agency, and any other agencies with jurisdiction over your project.

3. The Board understands you have completed some groundwater modeling for your project specific to OU-1. Please provide the Board with all documents and electronic files relating to the groundwater modeling work you are performing.

It is the Board's intent that this important project proceeds as quickly as possible and we look forward to the scheduled start date. Please forward your response to Tony Zampiello at the Raymond Basin Offices. If you should have any questions please call (818/790-4036).

Very truly yours,

A handwritten signature in black ink, appearing to read "Robert Hayward", is written over a horizontal line.

Robert Hayward  
Chairman,  
Raymond Basin Management Board

Copy: RBMB Executive Board  
P. Currie, Pasadena Water & Power  
S. O'Neill, Esq.

National Aeronautics and  
Space Administration  
Office of Space Science



**NASA Management Office**

180-801  
Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, CA 91109-8099

Reply to Attn of:

SMD/NMO

September 14, 2004

Response to RBMB letter of February 18, 2004

Raymond Basin Management Board  
Attn: Anthony C. Zampielo  
Assistant Executive Officer  
725 North Azusa Avenue  
Azusa, CA 91702

Dear Mr. Zampielo:

Thank you for your letter of February 18, 2004 regarding NASA's plans to implement the Operable Unit 1 Expanded Treatability Study. Responses to each of your comments are provided as follows:

*Comment 1:* Since JPL plans to extract water from the Basin, how will JPL replenish the basin to cover water lost in the process?

*Response:* Over 99.5% of the extracted groundwater will be re-injected to replenish the Basin. Less than two (2) acre feet per year of water will be lost as part of the treatment process. Based on discussions with the water purveyors in the Raymond Basin, NASA would not need to cover such a small volume of lost water.

*Comment 2:* Please provide formal documentation to the board that your proposed cleanup project in OU-1 is in full compliance with all legal and regulatory requirements of the Regional Water Quality Control Board, the Department of Health Services, and U.S. Environmental Protection Agency, and any other agencies with jurisdiction over you project.

*Response:* The NASA-JPL Federal Facilities Agreement (FFA) was finalized in December 1992 and signed by NASA, the U.S. Environmental Protection Agency, the California Regional Water Quality Control Board, and the California Department of Toxic Substances Control. The FFA is the guiding document for NASA-JPL Comprehensive Environmental Response, Compensation, and Liability

Act (CERCLA) Program and provides the formal documentation requested. NASA has received approval from all FFA parties for the OU-1 Expanded Treatability Study. The FFA is available online at:

<http://jplwater.nasa.gov/NMOWeb/AdminRecord/docs/NAS70753.pdf>

*Comment 3:* The Board understands you have completed some groundwater modeling for your project specific to OU-1. Please provide the Board with all

documents and electronic files relating to the groundwater modeling work you are performing.

*Response:* NASA (through Battelle) has been closely coordinating groundwater modeling efforts with the Raymond Basin Management Board (through Geoscience). Battelle provided electronic files associated with modeling efforts to Geoscience in September 2003, January 2004, and February 2004. Please let me know if these files should be provided to others.

I appreciate the Board's interest in the project proceeding as quickly as possible. With continued communication and cooperation of all the parties, we can start this expanded treatability study as well as continue to push forward on the overall cleanup program.

Sincerely,

Steven Slaten  
NASA-JPL Remedial Project Manager

cc: Robert Hayward

# RAYMOND BASIN MANAGEMENT BOARD

725 North Azusa Avenue, Azusa, CA 91702 (626) 815-1300 FAX (626) 815-1303

City of Alhambra

City of Arcadia

California-American  
Water Company

East Pasadena  
Water Company

H.E. Huntington Library  
and Art Gallery

Kinneloa Irrigation District

La Canada Irrigation District

Las Flores Water Company

Lincoln Avenue Water  
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Pasadena Cemetery  
Association

City of Pasadena

Rubio Cañon Land and  
Water Association

San Gabriel County  
Water District

City of Sierra Madre

Sunny Slope  
Water Company

Valley Water Company

November 22, 2005

Mr. Mark Ripperda  
U.S. Environmental Protection Agency  
Region IX  
75 Hawthorne Street  
San Francisco, CA 94105

## **RE: On-Going Operation and Future Expansion of Treatment and Injection of Groundwater at NASA-JPL's Operable Unit 1**

Dear Mr. Ripperda:

This office represents the Raymond Basin Management Board ("Board"), which was formed by the Los Angeles County Superior Court when it adjudicated the Raymond Groundwater Basin in *The City of Pasadena v. City of Alhambra* (Los Angeles County Superior Court, Case No. Pasadena C-1323.) The court has charged the Board with the powers and responsibilities of managing the Raymond Basin and to protect the long-term quantity and quality of the groundwater supply.

As you know, we have been participating in the Remedial Project Management (RPM) meetings for the three Operable Units your agency is currently managing that overlay the Raymond Basin. It has always been our belief that the end result of your efforts will serve to benefit our interests by cleaning-up groundwater pollution in our basin and wherever possible we have worked with EPA and NASA-JPL to expedite these activities.

On January 30, 2004, our office received notification from Mr. Steve Slaton, the current project manager for NASA-JPL, informing us of NASA-JPL's intent to construct the Operable Unit 1 (OU-1) Expanded Treatability Study (ETS) (copy attached). After conferring with the Board our attorney prepared and sent a letter of reply on February 18, 2005 (also attached) asking for further clarification of how NASA-JPL intended to operate the facility and remain within the provisions of our judgment. We never received a written response to that letter and in subsequent conversations I have had with Mr. Slaton he has expressed no intention of responding in writing or addressing our concerns. I am extremely disappointed by this position and lack of response by Mr. Slaton and NASA-JPL.

Mr. Mark Ripperda  
November 22, 2005  
Page 2

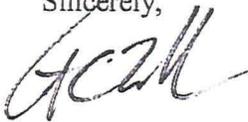
My concerns were recently intensified by Mr. Slaton's comments at the November 15, 2005, RPM Meeting regarding NASA-JPL's future plans at the OU-1 ETS. At that meeting I was surprised to hear that NASA-JPL is planning to expand operations at the OU-1 ETS when it appears they have no intention of addressing our original letter or the concerns expressed regarding initial OU-1 ETS operations. Although I am of the opinion that most, if not all, of our requirements can be fulfilled by Board action and/or minor modifications to the Court Judgment, our responsibility as an arm of the Court cannot simply be ignored by NASA-JPL.

Current clean-up activities at the OU-1 ETS, as well Mr. Slaton's November 15, 2005, proposal to pump, treat and spread additional groundwater produced at the OU-1 site clearly fall within Raymond Basin Management Board's area of oversight and enforcement. Whether the treated groundwater is recharged within the Basin or discharged elsewhere, it must be produced within the provisions of the Judgment and properly accounted for.

The Raymond Basin Management Board understands the importance of containment of groundwater contamination emanating from the OU-1 site and only for that reason has not yet taken formal action to curtail groundwater production by NASA-JPL. It continues to be our goal to encourage effective clean-up of basin contamination by those responsible and for many years our Board has supported the clean-up strategies imposed by EPA in the Raymond Basin. We want to see clean-up strategies implemented as quickly as possible and that is why, in the spirit of mutual support, I am writing to ask for your help in encouraging Mr. Slaton and NASA-JPL to work with us to resolve outstanding issues that are in direct conflict with our Judgment. As the appointed body representing the Court the Raymond Basin Management Board cannot proceed indefinitely without formal resolution of these outstanding issues. It is my hope that resolution can be reached in a cooperative manor in order to avoid enforcement action through the Court.

Please contact my office at your earliest convenience to further discuss your thoughts on resolution of this matter (626) 815-1300.

Sincerely,



Anthony C. Zampielo  
Executive Officer

cc: Mr. Steve Slaton, NASA-JPL  
RBMB Members

National Aeronautics and  
Space Administration  
Office of Space Science



**NASA Management Office**

180-801  
Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, CA 91109-8099

Raymond Basin Management Board  
Atten: Anthony Zampiendo, Executive Officer  
725 North Azusa Avenue  
Azusa, CA 91702

Response to RBMB letter dated November 22, 2005

December 12, 2005

Dear Mr. Zampiendo:

We received a copy of your letter to Mr. Mark Ripperda, dated November 22, 2005, regarding the on-going operation and future expansion of NASA's Operable Unit 1 (OU-1) treatment system at the Jet Propulsion Laboratory (JPL). NASA understands your concern associated with compliance to provisions of the Raymond Basin Judgment and we certainly share your interests in cleaning up the groundwater affected by chemicals originating from JPL.

As a courtesy, attached is my response of September 14, 2004 to your letter of February 18, 2004. We now have operating data on which to base our projections. Below is additional information, including actual operating data, that I think may be helpful.

Our demonstration treatment plant has been operating at approximately 150 gpm since March 2005. Considering the nine months of operational data we have collected, responses to your comments from February 2004 are provided as follows:

*Comment 1:* Since JPL plans to extract water from the Basin, how will JPL replenish the basin to cover water lost in the process?

*Response:* The volume of water discharged to the sanitary sewer in the treatment process will be de minimus. In fact, through November 2005 NASA has injected more water than it has extracted. Therefore, NASA does not need to cover water lost in the process.

Since completing construction of the facility, NASA has treated and re-injected approximately 51M gallons of water (measured by flow meters installed on the extraction and injection well pipelines). Of this 51M gallons, approximately 48,000 gallons (0.15 ac-ft) has been discharged to the sanitary sewer or shipped off-site. The remaining treated water has been re-injected back into the aquifer.

As you know, in response to your earlier concerns regarding discharged water, NASA installed a clarification system at an additional cost of several hundred thousand dollars that minimizes the amount of water discharged to the sanitary sewer by concentrating the solids prior to batch discharge to the sanitary sewer. Wastewater from the OU-1 plant is discharged in batches of 12,000 gallons. To date, three discharges have been conducted, as summarized in Table 1. Another 12,000 gallons of wastewater was hauled offsite for disposal.

**Table 1. Summary of Discharges to the Sanitary Sewer**

Batch Number	Date of Discharge	Volume
1	April 5, 2005	12,000
2	September 26, 2005	12,000
3	October 31, 2005	12,000
<b>Total</b>		<b>36,000</b>

Discharge to the sanitary sewer is conducted in accordance with the Los Angeles County Sanitation District (LACSD) industrial waste discharge permit for JPL. The OU-1 plant was inspected in November 2005 by the LACSD and the system was in full compliance.

The concrete pad is fully contained by a twelve inch concrete curb. The area within the curb is 3,590.75 ft<sup>2</sup> and drains to the sump that is part of the clarification system. Therefore, any rainwater that falls within the curbed area of the treatment facility is captured by the system and eventually injected into the aquifer. Each inch of rain that falls on the pad equates to approximately 2,200 gallons of water entering the system. With over 36 inches of rain falling so far in 2005, an estimated 81,000 gallons (0.25 ac-ft) of rainwater has been processed at the treatment plant and reinjected.

In addition, tap water is used for various purposes within the curbed area of the concrete pad. This water drains to the sump. To date, approximately 2,500 gallons of water has been used (based on the water meter installed at the facility). Therefore, over 83,000 gallons (0.255 ac-ft) of rainwater and tap water has been injected into the aquifer by the treatment system. This volume significantly exceeds the volume of water discharged to the sanitary sewer or hauled off-site (i.e., 48,000 gallons).

The proposed system expansion would double the treatment flow rate. Based on system operations to date, we do not expect discharged water volumes to exceed 0.5 ac-ft/yr after system expansion. Additionally, NASA will consult with the Board prior to any operational changes that could result in discharged water of over 2 ac-ft per year.

*Comment 2:* Please provide formal documentation to the board that your proposed cleanup project in OU-1 is in full compliance with all legal and regulatory requirements of the Regional Water Quality Control Board, the Department of

Health Services, and U.S. Environmental Protection Agency, and any other agencies with jurisdiction over you project.

*Response:* The NASA-JPL Federal Facilities Agreement (FFA) was finalized in December 1992 and signed by NASA, the U.S. Environmental Protection Agency, the California Regional Water Quality Control Board, and the California Department of Toxic Substances Control. The FFA is the regulating document for the NASA-JPL Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Program and provides the formal documentation requested. NASA has received approval from all FFA parties, including the Regional Water Quality Control Board, for the OU-1 Expanded Treatability Study. The FFA is available online at:  
<http://jplwater.nasa.gov/NMOWeb/AdminRecord/docs/NAS70753.pdf>

*Comment 3:* The Board understands you have completed some groundwater modeling for your project specific to OU-1. Please provide the Board with all documents and electronic files relating to the groundwater modeling work you are performing.

*Response:* NASA has been closely coordinating groundwater modeling efforts with the Raymond Basin Management Board. NASA provided electronic files associated with modeling efforts to the Raymond Basin Management Board in September 2003, January 2004, and February 2004. We conducted a meeting with representatives from the RBMB, including yourself, on March 31, 2005. Please let me know if these files should be provided to others.

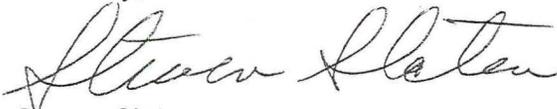
To ensure more timely communications with the Board, I propose the following:

- A meeting/site tour at the OU-1 facility in early 2006.
- Quarterly teleconferences, or more frequently as needed, that are separate from the monthly/quarterly RPM discussions.
- Ensuring that the Board is included on distribution on the progress reports. The latest progress report is available at:

[http://er.battelle.org/projects/ETIC/ETIC\\_CTO117/home/Oct05-ProgressRpt/OU1-Oct05.htm](http://er.battelle.org/projects/ETIC/ETIC_CTO117/home/Oct05-ProgressRpt/OU1-Oct05.htm)

I appreciate the Board's interest in the project.

Sincerely,



Steven Slaten  
NASA-JPL Remedial Project Manager

Attachment: RBMB Letter 9-14-04

cc: Mark Ripperda

National Aeronautics and  
Space Administration  
Office of Space Science



**NASA Management Office**

180-801  
Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, CA 91109-8099

Reply to Attn of:

SMD/NMO

September 14, 2004

Response to RBMB letter of February 18, 2004

Raymond Basin Management Board  
Attn: Anthony C. Zampielo  
Assistant Executive Officer  
725 North Azusa Avenue  
Azusa, CA 91702

Dear Mr. Zampielo:

Thank you for your letter of February 18, 2004 regarding NASA's plans to implement the Operable Unit 1 Expanded Treatability Study. Responses to each of your comments are provided as follows:

*Comment 1:* Since JPL plans to extract water from the Basin, how will JPL replenish the basin to cover water lost in the process?

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Sincerely,

Steven Slaten  
NASA-JPL Remedial Project Manager

cc: Robert Hayward