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REMEDIAL PROJECT MANAGERS' MEETING

NASA JET PROPULSION LABORATORY

18 February 1998

ATTENDEES:

- Charles L. Buri, JPL
- Alex Carlos, RWQCB-LA
- James Chang, US EPA
- Mark Cutler, Foster Wheeler
- Richard Gebert, DTSC
- Vitthal S. Hosangadi, Foster Wheeler
- Stephen Niou, URS
- Judith A. Novelly, JPL
- B.G. Randolph, Foster Wheeler
- Peter Robles, Jr., NASA

Reported by: Louise K. Mizota, CSR 2818

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Pasadena, California

February 18, 1998

10:12 A.M.

BURIL: For the benefit of our recorder, why don't we go around the table and make sure everybody introduces themselves and we know who's who. I'll start. I'm Chuck Buriel, Manager, Environmental Affairs here at JPL and the Project Manager for JPL here at the facility.

ROBLES: Peter Robles, NASA employee. I'm the RPM for the Superfund site here at JPL Pasadena.

NIOU: Stephen Niou, URS, technical support to EPA.

CHANG: James Chang, EPA RPM.

GEBERT: Richard Gebert, DTSC RPM.

CUTLER: I'm Mark Cutler with Foster Wheeler Environmental, the groundwater Operable Units for JPL.

NOVELLY: Judy Novelly, JPL.

CARLOS: Alex Carlos, Regional Board.

HOSANGADI: Vitthal Hosangadi, with Foster Wheeler.

RANDOLPH: B.G. Randolph, Foster Wheeler, Operable Unit 2.

1 BURIL: Okay. Let's go ahead and just jump into
2 this data on the quarterly monitoring.

3 Mark, do you have tables? Do you have
4 enough to pass around?

5 CUTLER: No, I don't.

6 BURIL: We'll get copies later. Let's go ahead
7 and share what we've found thus far on Wells 22, 23
8 and 24. I'll share with you also that we have some
9 information on our quarterly groundwater monitoring
10 report, which is basically going to be finalized
11 here in the next couple of weeks to get out to you
12 folks that includes this data. Some interesting
13 stuff.

14 Mark, why don't you go ahead and start.

15 CUTLER: You guys remember where the wells are?

16 NIOU: Yes.

17 CUTLER: For Alex's --

18 ROBLES: Why don't you point them out. Tell me
19 where they are.

20 CUTLER: Well 24. B.G. knows. Right there.

21 RANDOLPH: Up on Aero Road.

22 CUTLER: It's right in the middle of the hot
23 spot on the site. Carbon tet was detected in the
24 upper two screens only at 5 and 13 parts per
25 billion, respectively.

1 ROBLES: We're talking about right there.

2 CUTLER: Right.

3 TCE was detected only in the upper two
4 screens at 5 and 1.3.

5 And perchlorate was detected only in the
6 upper two screens at 92 and 200, respectively.

7 ROBLES: So it's down from 600 that we had
8 before.

9 CUTLER: Real minor hit of Freon, but another
10 basic. It's not very high and not very deep.

11 ROBLES: Okay.

12 CUTLER: Well 22, which is the farthest east --

13 BURIL: It's right behind 180.

14 CUTLER: Right behind 180. Right there.

15 No carbon tetrachloride. No TCE. Very
16 low level of PCE at 2.0, very similar to what we see
17 coming on site like at Well 14 right at the far
18 western edge of the site.

19 ROBLES: Right there.

20 CUTLER: Chuck will get into the tie-in with off
21 site probably a little bit after this. Perchlorate
22 was found in the third screen down at 15 parts per
23 billion.

24 Now, if we draw cross-sections -- we don't
25 have this here. Unfortunately, I didn't know we

1 were going to get into this, but Valley Water
2 Company upgradient from us has been injecting MWD
3 water and it looks like that stuff could be
4 sneaking on site at deep levels. That's just right
5 now a working hypothesis.

6 BURIL: Let's expand on that just for a moment.
7 MWD water is typically injected by Valley Water
8 Service. Valley Water Service actually doesn't have
9 any of its own wells. It only operates off of MWD
10 water. And they do have the ability to inject water
11 to augment the amount of water that's available in
12 the Raymond Basin. And they're doing that and they
13 have been doing that now for some time. Exactly how
14 long, I don't know.

15 What we're actually seeing at this
16 juncture is in our Well Number -- 14, Mark? Where
17 the upper screen, perhaps the upper two screens are
18 clean in terms of perchlorate. The third screen
19 shows 1s to 10s level, and the bottom screen is
20 clean.

21 So how it would actually get down to that
22 level, upgradient in essence, was something of a
23 mystery to us until after we found out these folks
24 were injecting this water. So it appears that there
25 may be some connection between the two of them.

1 CUTLER: Right. There's a real disconnect from
2 what we see on site to these off-site wells. It's
3 shallow on site and very deep on the western edge of
4 the facility. It just lines right up with Valley
5 screen levels as well. It's kind of interesting.

6 Well 23, which was the well -- I think --
7 a little bit more to the east. But that's okay.

8 BURIL: It's where it says "Road" there, Pete.
9 See the word "Road" under 183?

10 RANDOLPH: Right here.

11 ROBLES: Right there.

12 CUTLER: There is no carbon tetrachloride. TCE
13 at 3.1. PCE at .6. 1,1-DCA at .8. These levels
14 are very similar to what we see coming up from Well
15 14, kind of an upgradient type of signature, if you
16 will. And perchlorate in the upper two screens at
17 4.4 and 7.6.

18 So all in all, those wells didn't find a
19 whole lot. They helped narrow the extent quite a
20 bit.

21 GEBERT: Yes. It seems like you've defined at
22 least the horizontal extent.

23 CUTLER: Exactly.

24 BURIL: Exactly

25 CUTLER: And the vertical.

1 BURIL: And the vertical, actually.

2 CUTLER: Only down two screens.

3 BURIL: Let me for Alex's benefit -- and the
4 rest of you forgive me, let me just make him aware
5 of this whole history.

6 Just briefly for Alex's benefit, when we
7 installed these three wells it was on the basis of
8 some information that we generated about our well
9 MW-10, which is down here at the bottom. What we
10 found there led us to believe that one of two things
11 was happening. Either because of the hydrodynamics
12 of the area we were somehow ending up with some form
13 of a southerly flow coming out of the Laboratory
14 that was bringing contaminants past MW-10 and to the
15 south of the JPL site. I don't know if you're
16 familiar with the flow reversals that we see here.

17 CARLOS: A little bit.

18 BURIL: Basically, it was as a result of the
19 flow reversals that we think we might have had an
20 induced southerly flow coming out of the southern
21 part of the site. Either that, or that because of
22 the hydrodynamics again, that on occasion we would
23 see more of an influence of what we've termed the
24 upgradient water type.

25 In fact, we went through an analysis of

1 the water types in terms of their cation-ion ratios
2 and the diagrams that you generate, and we found
3 that we actually had several very distinctive kinds
4 of water. And when the concentrations of VOCs in
5 Well 10 were high, they correlated with the water
6 type that was actually upgradient of us. When the
7 concentrations were lower by as much as an order of
8 magnitude, it corresponded with the water type that
9 we see here on the site.

10 So there was kind of a conflict of
11 information. And so what we wanted to do was to
12 install wells to do several things. One was to
13 understand in the area of highest contamination how
14 deep it went, which is the one that Peter is
15 circling right there.

16 Secondly, because we had Well MW-16 and
17 Well 13 showing concentrations of VOCs, we needed to
18 know kind of an understanding of how far out they
19 extended. We didn't see it out at 14, but we could
20 drop a well kind of halfway between as close as we
21 could to understand what we were dealing with there
22 in terms of an eastern extent of contamination and
23 maybe give us a little better insight as to the
24 water contouring on the site.

25 The well to the south, number 23, that was

1 placed to try to improve our understanding about the
2 contaminant distribution going to the south and give
3 us a better understanding of the groundwater contour
4 distribution. Our thoughts were that if we saw the
5 contours giving us indication that there was a
6 strong southerly flow and that we were actually
7 seeing a gradient of concentration in terms of the
8 concentration of contaminants from the 16-13 area
9 going down to 23 and then out through 10 and then
10 out that way, that would give us an indication
11 of what's going on in terms of just potential
12 southerly flow.

13 What we really found -- by no means are
14 these data conclusive. I mean, one set of data
15 doesn't tell the world, but it looks pretty good on
16 several fronts. First, in terms of the depth of
17 concentration in Well -- MW-22? Is that in the
18 middle?

19 CUTLER: Yes.

20 BURIL: The one on Aero.

21 CUTLER: That's 24.

22 BURIL: 24. I keep mixing these up. Thank you.
23 We'll get you this data table at the break. We'll
24 get it Xeroxed for you so you can take it with you.

25 But basically, below the second screen we

1 don't see anything. This was our relatively
2 identified hot spot.

3 So it appears that the idea of increasing
4 concentration with depth in the groundwater is not
5 the case in the area of the hot spot. So that's
6 good news for us. We don't have what appears to be
7 a potential for a denapple consideration of this
8 site, which is, I think, really good news.

9 In terms of the concentrations going to
10 the east between the area of 16 and 13 and MW-14, it
11 appears that the concentrations are somewhat limited
12 in their eastern migration. It fades out fairly
13 fast between 16 and MW-22.

14 CARLOS: The well just north of 180, what number
15 is that?

16 BURIL: That's 22.

17 CUTLER: Yes.

18 CARLOS: 22.

19 BURIL: So that fades out pretty quick. Thank
20 you, Peter.

21 ROBLES: And this is --

22 BURIL: 23. And that's 24. I keep getting 22
23 and 24 switched.

24 Now, in terms of 23, which is the one that
25 we were really looking to to tell us the story about

1 the southerly component of flow, we've got a couple
2 of things. One, we've got kind of an interesting
3 blend of contamination when you look up at 16 and 13
4 and you get down to 23 you look again at 10. The
5 concentrations drop off at 23 fairly significantly
6 from what they are up at 16 and 13. Then they gain
7 a little bit as you're going toward 10. Now, that
8 might be analytical error. And we can all
9 understand that. We don't want to hang our hat on
10 that one piece of data.

11 However, when you start looking at the
12 water types that we have, and I'll just lay these on
13 the table for you all to look at, take a look at
14 Well Number 13 and the shape of the stiff diagram
15 that we have there. That's a fairly distinctive
16 water type from Well MW-10. It's quite a bit
17 different. In fact, this is the one that we've
18 characterized as more or less the on-site water
19 type, and this one being characterized as the
20 off-site water type.

21 I'll show you that when we look at our
22 upgradient wells, Well Number 14, Well 10 and Well
23 14 shapes are very similar. So they appear to be
24 the same water type, more than likely from the same
25 source.

1 When you start comparing those to, say,
2 the Well MW-24 type, which would be our hot spot,
3 it's quite a bit different. In fact, this matches
4 what we call the on-site water type. If you look at
5 23, you can see that there's more influence from the
6 off-site area than there is from on site. And 22
7 you see the same kind of pattern.

8 So in the western part of the Lab, through
9 14 and getting up to about 22 and 23 and so forth,
10 we appear to be under a fairly good influence of
11 off-site water. So it would make some sense that
12 any contaminants that we find in those wells may
13 also be associated with that off-site water.

14 Now, again, this is not conclusive in
15 terms of drawing a final conclusion on this because
16 we do want to get more data points. And, in fact,
17 we've got another data point coming in from our next
18 groundwater sampling event, which we just finished
19 last week.

20 CUTLER: Yes.

21 BURIL: And we hope to have the data back on
22 that within another -- three weeks?

23 CUTLER: That's what the lab tells us. That's
24 what we're telling the lab.

25 GEBERT: What specifically is the new data

1 point?

2 BURIL: Well, the new data point is the next
3 round of quarterly sampling for all the wells. What
4 we're hoping is that that will shed either
5 additional light on this whole situation in terms of
6 water types and in terms of contaminant
7 concentrations and we may be able, then, to make
8 some judgments as to what it is we need to do in
9 terms of any additional studies, which off the top
10 of my head I don't see. But regardless, we may be
11 able to make some other determinations in that, and
12 maybe make some determinations in the area of
13 influence that we need to deal with for remediation
14 here on the site.

15 CUTLER: This event we just finished, that data,
16 we begin the RI report in about four weeks,
17 according to the schedule. So all the data we
18 have --

19 BURIL: This is going to be coming out soon.

20 CUTLER: We collected everything.

21 GEBERT: Right. I think after this next round,
22 it will be one year of -- except for the new wells,
23 one year of sampling.

24 BURIL: That's right.

25 CUTLER: Right. We'll continue the quarterly

1 sampling, but we have now enough data to start the
2 RI report.

3 BURIL: These two sets of data that we're
4 talking about now will be the basis of developing
5 the RI, as well as having continuing data for the
6 quarterly sampling.

7 CARLOS: Are there any groundwater monitoring
8 wells further to the west?

9 BURIL: Nothing beyond our own property line.
10 Because of the concentrations that we could
11 historically see in Wells 14 and 6 -- it says MW-2
12 there, but MW-2, just a piece of quick history, was
13 installed by the Army Corps of Engineers, gosh, way
14 back in the late '80s, wasn't it?

15 CUTLER: I believe it was '89.

16 BURIL: As they were drilling that one and Well
17 MW-1, the contract ran out of money and so they cut
18 the drilling of MW-2 off at a given depth. I
19 believe at that particular time it was in the
20 saturated zone. But subsequently with water tables
21 lowering and so forth, that well is dry most of the
22 time, which is why we put MW-14 there, is to try to
23 make up for not having that data point.

24 But basically, MW-6 and MW-14 show very
25 little, if any, contamination. In fact, given the

1 water types that we're seeing, we believe those to
2 be upgradient wells.

3 So basically, it's beginning to look as
4 though the southerly component of flow that we were
5 concerned with and its bringing of contaminants all
6 the way from here all the way down to MW-21 is
7 beginning to look less likely and that there may be
8 some other source for the TCE, and certainly I think
9 we could say for the PCE off site. Now, recall that
10 PCE levels here on site are typically less than 2 or
11 3 parts per billion, usually less than 1 throughout
12 the site. Is that right?

13 CUTLER: Right. It's very low.

14 BURIL: At the Valley Water Service wells, which
15 is the red dot there on Hampton Street, near the
16 Flintridge School for Boys, to the far left there,
17 they have historically seen, I don't know if they're
18 still seeing concentrations like this, but they have
19 seen concentrations into the high 10s, low hundreds
20 numbers of PCE. In fact, they have an air stripping
21 tower. Just as a quick reminder, they're treating
22 the water to get it to be able to be used for their
23 facilities or their customers.

24 I'm going to back up just a minute. I may
25 have misspoken. Valley does have wells. It's

1 Foothill Water Service which is right there that
2 doesn't. They inject the water. I have to switch
3 that around. Sorry. They're right literally next
4 door to each other.

5 So it appears that based on the data that
6 we're getting so far, that the off-site influence to
7 not only our own site but to the wells to the east,
8 and these are the ones with the red dot with the
9 white circle around them. Alex, for your benefit,
10 these four here are City of Pasadena. These are
11 Lincoln Avenue water wells, and then our own
12 monitoring wells out here. Trying to delineate the
13 plume.

14 It's looking more and more like there is
15 something to the off site, to the west of us coming
16 out of the La Canada-Flintridge area. But again,
17 we'll get some more data and either bolster or
18 contradict that particular hypothesis as we go
19 along. But it's beginning to look more and more
20 suspect.

21 Any questions anybody has on what we've
22 got so far?

23 GEBERT: What was the perchlorate data on the 23
24 and 24?

25 CUTLER: We'll try to make a copy. On 22, it

1 was in the middle screen, the third screen down. On
2 23, the southerlymost, it was in the upper two
3 screens, very low levels. And in the middle of the
4 site it was in the upper two screens at 92 and 200.

5 CHANG: Chuck, you guys have wellhead treatments
6 throughout different areas, right, off site?

7 BURIL: We personally don't operate them, but we
8 have funded for the City of Pasadena, we have a
9 wellhead treatment system for the four wells that I
10 pointed out. That's a VOC treatment system. It's
11 basically air stripping.

12 And at one of the Lincoln Avenue wells,
13 Lincoln Avenue chose to install a carbon absorption
14 system for that well. It's capable of treating the
15 effluent from either well, but it doesn't have the
16 capacity to treat both wells simultaneously.

17 Now, we have an agreement with the City of
18 Pasadena to fund the construction and operation of
19 the treatment system. That's the air stripper for
20 the City of Pasadena. And we've been working for
21 quite some time with Lincoln Avenue to come up with
22 an agreement with them in like fashion as
23 Pasadena's. And we're still working on that.

24 Okay. That's where we're at now as far as
25 that one goes.

1 If you have any questions down the road,
2 please feel free to ask. We're more than happy to
3 try to answer them.

4 On perchlorate, this one has been going
5 kind of hot and heavy here of late. We've had a
6 number of events that I think are worthy of note for
7 you folks to be aware of.

8 First of all, starting with the public
9 supply wells, the Arroyo Well, which is the
10 northerlymost well for City of Pasadena, that well
11 has been shut down, as I think I mentioned to you
12 before. It has been shut down since early July of
13 last year.

14 ROBLES: That's the one right there.

15 BURIL: They've tested it just recently, is my
16 understanding, and the concentration of perchlorate
17 was at about 140, 145 parts per billion, the limit
18 being 18, of course.

19 CHANG: This is out of a production well?

20 BURIL: This is out of a production well.

21 That's correct.

22 CHANG: Not a monitoring well.

23 CUTLER: But it is shut down.

24 BURIL: It has been shut down for quite some
25 time.

1 The next well down for the City of
2 Pasadena is their Well Number 52.

3 ROBLES: That's the first one that's shut off.

4 BURIL: Well Number 52, the most recent
5 information I have from the City indicates that it
6 is in the 20 parts per billion range, 20, 22,
7 somewhere in that range. They are currently
8 continuing to use the well, based on what I know so
9 far, and they are blending water to bring the total
10 concentration below the action level. If it goes up
11 any more, they will have to shut that down because
12 they won't have the ability to blend it out.

13 CHANG: So 52 is downgradient from the Arroyo
14 Well? I'm not sure.

15 BURIL: No. It's actually cross-gradient if you
16 look at it in terms of the regional flow. It's
17 almost due south.

18 ROBLES: It's this way.

19 BURIL: Yes. That's the flow direction, more or
20 less.

21 CHANG: Okay.

22 BURIL: That varies, depending on --

23 ROBLES: These are the four wells that belong to
24 Pasadena, the top two.

25 BURIL: Can you see over there?

1 CARLOS: Yes. I can see.

2 BURIL: And the remaining two wells for the City
3 of Pasadena continue to have relatively low
4 concentrations, under 10 parts per billion, of
5 perchlorate. Now, the reasons for the differences
6 in the City of Pasadena wells is still unknown.
7 There has been some work done by the City trying to
8 find a geological or structural reason for this to
9 happen. We've got some theories, all of which are
10 not worth sharing at this juncture just because they
11 are nothing more than that.

12 But there appears to be some connection
13 between the well screens and the type of material
14 the wells are screened in that appears to allow the
15 Arroyo well to see such high concentrations as
16 compared to Well 52 or even Lincoln Avenue Well
17 Number 3, which is the one which is located near our
18 Well MW-17.

19 Lincoln Avenue's wells still both are
20 below the 18 parts per billion limit. In fact, my
21 last understanding is that they are under 10. So
22 they are there in the level of concern region, but
23 they still have not had high enough perchlorate to
24 dictate that they shut the wells down. And from my
25 understanding, they have never shut the wells down

1 on the basis of a perchlorate concern.

2 So why that's happening is still kind of a
3 question mark.

4 As a point of interest only, I have been
5 told that other wells farther south have seen
6 perchlorate. However, we can find no connection,
7 based on the data that we have, to the JPL site.
8 And, in fact, we believe that some other source,
9 potentially the Metropolitan Water District water,
10 may be the culprit for that. And that's simply
11 because MWD water is often supplied to these same
12 water companies and ultimately to their customers
13 and through the course of time may have created a
14 condition that we're now beginning to see in the
15 various water wells.

16 ROBLES: That's here.

17 BURIL: MW-17. Mark, do you have MW-17's
18 latest?

19 CUTLER: Sure. Screen 1, no perchlorate.
20 Screen 2, no perchlorate. Screen 3, the two
21 sampling events, one was 12 and one was 55. Screen
22 4, for two sampling events, was 13 and 16. The
23 bottom screen, the two sampling events was 12 and
24 15.

25 BURIL: So aside from that one flyer above the

1 18, about the same levels that we see in the Lincoln
2 Avenue wells.

3 ROBLES: These are the two Lincoln Avenue wells
4 right here.

5 BURIL: Right.

6 CHANG: Just a point of curiosity.

7 BURIL: Sure.

8 CHANG: The wells that you just shared, do those
9 contamination levels, have they fluctuated since the
10 production well shut down? I guess that was the
11 Arroyo Well. Right?

12 CUTLER: You mean the perchlorate?

13 CHANG: Yes, for perchlorate.

14 CUTLER: Well, they shut down in July or, June
15 or July. The Well 17 right behind it went from 12
16 to 55. The other two screens were about identical.
17 But we only have really one point.

18 CHANG: Sure.

19 CUTLER: We only sampled for perchlorate twice
20 that we have data for.

21 BURIL: We're waiting for the next set.

22 CUTLER: We have one before and one after, so
23 it's hard to tell.

24 CHANG: The only reason why I ask that, since
25 the Arroyo well has been shut down since July '97, I

1 guess the other production wells are producing
2 massive amounts, we could be spreading the plume a
3 little bit.

4 BURIL: We're quite concerned about that.

5 CUTLER: Yes, we're concerned about that.

6 CHANG: Okay.

7 BURIL: In fact, I'll pass along to you some
8 other things that the City of Pasadena has asked us
9 to consider. One of their proposals was that we
10 install some form of a remedial action on site to
11 try and contain the perchlorate. It was their
12 calculations that something as small as 100 gallons
13 a minute may actually help contain the off-site flow
14 and stem the tide of perchlorate migration.

15 Personally, I'm not sure I can agree with
16 that small number, given the properties of the
17 aquifer. But we've gone ahead and asked our
18 computer modeler to take and put a removal well in
19 the model at 100 gallons a minute and do some work
20 on that to see just what kind of an area of
21 influence this might actually have.

22 Mark, do you have a status on that, by
23 chance?

24 CUTLER: He did some preliminary runs and over
25 the phone he thought it would be closer to 800, 1200

1 gallons a minute to really make a dent.

2 BURIL: That sounds more like the numbers I
3 would expect.

4 CUTLER: Because it depends how big a dent you
5 want.

6 BURIL: Yes, I think that's one of the things
7 that we intend to work out, and ultimately I think
8 we'll share that with the City of Pasadena once that
9 information is available to us. What 100 gallons a
10 minute buys us, versus the more likely number of 800
11 to 1200, may be even more gallons a minute.

12 Their suggested approach to dealing with
13 the perchlorate was to use a reverse osmosis unit to
14 treat it, which in and of itself seems reasonable
15 for a very small flow rate, given the fact that we
16 generate a fair amount of waste in terms of brine
17 when we're talking about RO units. They even
18 offered us access to some of their own facilities
19 off site. We don't have a picture here. I could
20 show it to you. But they have an old water
21 treatment facility located on the hill just above
22 JPL.

23 ROBLES: Right here.

24 BURIL: Yes. And they have a 30,000-cubic foot
25 tank. Actually, I guess it's a reservoir -- it's

1 not really a tank -- that they had offered us to
2 store the brine. Unfortunately, at that rate of
3 extraction of 100 gallons a minute and with the
4 anticipated brine production that we would get, we
5 would exhaust that thing's capacity in about 14
6 days. And with no foreseeable means of treating the
7 brine at this particular moment to remove the
8 perchlorate or whatever else we might generate in
9 that, I don't know, my guess is that perchlorate
10 would be the driver, we would be faced, then, with
11 either storing the stuff in tanks or doing some
12 other kind of storage until an appropriate mechanism
13 could be found to treat the brine. So we're
14 evaluating that potential, but it appears like their
15 request, while very understandable, is something
16 that would be difficult for us to try and find a way
17 to implement during a long period of time.

18 Regardless of all that, we are still
19 pursuing several avenues on the perchlorate
20 treatment front, the first of which is one which is
21 being done for us by Jacobs Engineering. And these
22 folks were looking at hydrogen introduction and
23 basically the chemical breakdown of perchlorate
24 through the introduction of hydrogen. The first
25 series of tests utilizing just the hydrogen -- well,

1 let's just say they weren't very promising. Did not
2 see any indication that there was a true opportunity
3 for us to actually find a good treatment technology
4 in that regard.

5 They have found, though, that in the
6 presence of catalysts, for example, a
7 palladium-impregnated carbon, that the perchlorate
8 appears to be susceptible to breakdown by hydrogen
9 in the presence of that kind of catalyst. So they
10 are pursuing that, albeit not vigorously, simply
11 because it doesn't look as though even that will
12 provide a complete treatment solution. It may
13 provide something which knocks high concentrations
14 down to low concentrations. But in terms of what
15 I'll term a good, strong polishing of the water, to
16 get it below 4 parts per billion, which is our
17 action level, we don't know. Personally, I don't
18 have a great deal of hope for it, but I'll be
19 waiting to see what the results of the final testing
20 will be. We're expecting that to be completed about
21 this time next month.

22 Now, the second type that we had hoped to
23 undertake, and I don't recall if I spoke to you
24 folks about a company called Applied Process
25 Technology or APT, well, I got a letter from them

1 after we talked on the phone and I expressed some
2 disappointment in not seeing them being a little bit
3 more forthcoming in terms of their providing
4 information on a proposal.

5 What the letter basically said is that
6 they've got a system that they use at the -- I guess
7 it's the Baldwin Park Operable Unit here in the San
8 Gabriel Valley. They inject some proprietary type
9 chemical ahead of the carbon sorption units that
10 they have. And then, lo and behold, as the material
11 comes out the back end of the carbon, the
12 perchlorate is gone. They thought it was something
13 that was maybe a catalytic reaction or something of
14 that nature, but they had some things happening with
15 the various concentrations of the constituents,
16 including VOCs and perchlorate, that they didn't
17 quite understand. They changed out the carbon, and
18 the perchlorate concentrations dropped again and
19 have stayed down ever since.

20 And they said, quite candidly, "We aren't
21 really sure why this is happening." So they are
22 continuing to do a fair amount of work there at the
23 site in Baldwin Park. I think it's Baldwin Park.
24 I'd have to doublecheck to be sure. I brought the
25 paper with me. But basically at this point they

1 have declined to participate with us until such time
2 as they do understand it and can actually come to us
3 with a proposal that they can make some sense out
4 of. So they've got the black box. It apparently
5 works, but no one knows why.

6 So we've kind of put that one on the shelf
7 in anticipation of their finally understanding what
8 is going on. And we'll be hoping that something
9 comes out of that.

10 The last one that we're dealing with is
11 with ion exchange technology and utilizing a fairly
12 well-known technology for nitrogen removal to deal
13 with perchlorate. We actually have two folks now
14 that are dealing with that for us. The folks from
15 Foster Wheeler, in fact, Mark and Vitthal are
16 working fairly diligently on this, proposed some
17 basic research on looking at the various resins and
18 coming up with what resins work, if any; how well do
19 they work; what are the regeneration criteria of
20 these resins; how much waste do you generate as a
21 result, et cetera, et cetera. A variety of things
22 of that nature.

23 And it's all very good, basic information
24 that we would need to be able to go into the field
25 and do any kind of a test.

1 About the time that they were finishing up
2 on their proposals Peter got a call from Calgon
3 Corporation. And Calgon came in and said, in
4 essence, over the course of time, said in essence,
5 "Well, we've done a lot of the work that Foster
6 Wheeler is proposing to do and, in fact, we're
7 willing to bring a field unit out and test it here
8 at JPL utilizing the resins and so forth that
9 through our work we believe to work the best for
10 perchlorate removal."

11 I'm still awaiting that proposal. And in
12 all candor, I am very, very interested in seeing
13 what they have to say about the work that they've
14 done thus far on the resins because I would hope
15 that they have done as complete a job as they've
16 indicated, particularly in comparison to what Foster
17 Wheeler has proposed, which is a very complete
18 evaluation of the resins themselves. And depending
19 upon a comparison of the two, we may choose one or
20 the other. There's maybe a possibility we might do
21 both, depending on what happens. We're still
22 waiting to get the information out of them.

23 But I'll share with you something I
24 thought was rather interesting. I don't know if you
25 folks have seen this particular technology.

1 Unfortunately I only have the one here, so I'll just
2 kind of lay it out here in the middle of the table.
3 They call this the ICEP technology. And basically,
4 it's a rotating series of columns that they use to
5 either have any number of columns either treating
6 water, being regenerated or being rinsed
7 simultaneously.

8 And the schematic of how this works is
9 kind of right here. They have this series that are
10 basically moving very slowly around a special
11 valving, shown here, that either directs water into
12 them that needs to be treated or brine out of them
13 or regenerate to regenerate them. But you'll be
14 treating water here in the areas that are in blue
15 and when you get to a point, you get over here, your
16 resin is close to being exhausted, you'll go into a
17 regeneration phase in the yellow. When it's been
18 regenerated, you'll rinse it, which is indicated in
19 the green, and then you'll start treating again.

20 And, in fact, they've got it plumbed in
21 such a fashion that the water that comes out of the
22 last two when you're getting close to being
23 exhausted actually gets sent back up to the
24 headworks, the ones that have just been regenerated
25 so you that don't have any breakthrough. And then

1 as those move in, you regenerate. They show two.
2 It could be any number of them, depending on what
3 you've got. And then you rinse them out and put
4 them back into service again.

5 This is a continuous process so that you
6 don't -- reportedly you don't need a regenerating
7 bed, a using bed and a back-up bed in order to
8 utilize this technology, which is kind of a typical
9 setup that you see.

10 And their proposal is that they would
11 bring this unit, a small one, out to JPL, be
12 running, oh, maybe 100 -- excuse me, maybe 10
13 gallons a minute, maybe a little more through it,
14 with the idea that we would be doing a field test to
15 see if this mechanism and the resins that they've
16 identified as being the most likely candidates are
17 capable of being used at the JPL site proper without
18 having to go through the continuing laboratory
19 evaluation.

20 It looks very promising. I'll make no
21 bones about that. It looks very promising.
22 However, it really depends on the kind of work that
23 they've done up front. Because there is a
24 tremendous number of resins that are available. I
25 don't know how many of you have been involved with

1 ion exchange technology, but there are literally
2 thousands of these things out there that can be very
3 specific about what it is they deal with and how
4 they are regenerated.

5 So while the mechanism itself looks very
6 promising, it's what's inside that counts. And
7 that's what I have to try to understand what they've
8 done to identify what's inside and making sure
9 that's the right thing to be using.

10 CHANG: So this is Calgon?

11 BURIL: This is Calgon Corporation. That's
12 correct.

13 That's about everything I can pass along
14 that I can recall on perchlorate.

15 CHANG: When is Foster Wheeler going to be done
16 with their evaluation, with their study?

17 BURIL: They have finished their last study
18 already. And basically that showed promise. Their
19 next proposal, which we got here just about a week
20 and a half ago or so, is being basically held up
21 until after we get the Calgon proposal. If we're
22 actually in a position of saying that the Calgon
23 work has, in large part, already done what Foster
24 Wheeler is proposing, then reinventing the wheel is
25 not something we necessarily need to do. If they

1 haven't done it, then it may be that the Foster
2 Wheeler work needs to precede the Calgon work. In
3 that case we may be doing both. If the Calgon
4 proposal comes back and is less than what we might
5 anticipate, then we may only proceed with the Foster
6 Wheeler work. It's still very much up in the air in
7 terms of what we might ultimately see coming out.
8 I'm supposed to get the Calgon proposal the end of
9 this week.

10 Okay. Anybody else have any questions on
11 perchlorate? Did I miss anything, anybody? Okay.

12 Update on the vapor extraction pilot test.
13 One thing that didn't get on here that I'm
14 surprised, now that I look at it, I think we should
15 probably include it under Other Items, is to go
16 through the soil vapor characterization comments
17 that you folks have. Somehow that just didn't land
18 on here. We definitely want to talk about that.

19 Let me go ahead and continue with this.

20 On the soil vapor extraction pilot test
21 response to EPA's comments and also to yours,
22 Richard, when we finished off with our last telecon
23 I think collectively, myself and Peter and Foster
24 Wheeler walked away thinking that for the most part
25 we had identified and addressed through our

1 explanations the comments that you had, with the
2 exception of the last one that you sent me, James,
3 about the casing size. We felt that we had
4 addressed the comments based on those explanations.
5 And I just wanted to be sure that you shared that
6 feeling at that point, that we had addressed
7 everything with the exception of the casing size
8 issue.

9 CHANG: Let's see. I think at the last
10 conference call you hadn't received our technical
11 support's comments yet. So I had faxed those to
12 you.

13 BURIL: Right. I recall he went through them in
14 pretty good detail and tried to answer it there on
15 the phone. My recollection and my feeling was that
16 we dealt with that fairly adequately. Do you two
17 share that response?

18 NIOU: Yes.

19 BURIL: Is there a need to do anything more with
20 those particular comments?

21 NIOU: Because I haven't seen your written
22 response yet, so I -- but last -- during the
23 telephone conference, I feel fairly comfortable.

24 BURIL: Okay. Good. Here is how we'd like to
25 approach this, without addressing Richard's comments

1 yet, which we want to talk about, and then your
2 additional comment, James.

3 What we were planning on doing was to
4 address the comments by submitting to you basically
5 the document, the overall plan at this juncture,
6 with everything built in and let you review that.
7 This is what we are hoping will be something that we
8 can review in fairly short order and not generate a
9 great deal more comments. We'll maybe even be able
10 to cut down on the comment periods if you're
11 comfortable with what you see so we can go as
12 rapidly as we can to implementation.

13 NIOU: Sure.

14 BURIL: That's our hope at this point. In fact,
15 I've got a copy of it here that if there are
16 specific questions we'd like to try and address, I
17 can do that here. But we can hopefully get this out
18 within the next week or two and have it to you
19 folks. That would be our formal submittal for the
20 workplan for the SVE.

21 Richard, I recall a lot of the comments
22 you brought up, in fact, I brought a copy of them
23 with me, really focused on the idea of following the
24 guidance document that you indicated.

25 GEBERT: You have to refresh my memory. I don't

1 recall having a lot of comments on it.

2 BURIL: Well, there were two that you had
3 written in, and then there was some information that
4 you had provided from a guidance --

5 GEBERT: Right. That was specifically regarding
6 the pour volumes. I think that was the --

7 BURIL: Let me ask you this.

8 GEBERT: I think you answered the --

9 BURIL: The first two?

10 GEBERT: -- okay in that fact that you indicated
11 there would be two tests.

12 BURIL: Right.

13 GEBERT: In the first test the questions
14 regarding the pour volume would be answered. So
15 prior to the beginning of the second test.

16 BURIL: So we answered your two questions
17 adequately?

18 GEBERT: Yes. My understanding was at the
19 telecon, we kind of gave the go ahead and it was
20 okay to proceed with the flow work.

21 BURIL: We've done that and we've got it. Like
22 I said, within a week or two we'll have it to you
23 folks to be able to finish out.

24 The one that we wanted to talk about,
25 though, James, was your comment about the casing

1 size and your concern about head loss and using an
2 inch and a half or that size casing and the size of
3 the hole.

4 Does everyone know what his comment was?
5 Let me just reiterate. His suggestion was that we
6 go to a 4-inch case to try to minimize friction loss
7 as a result of having a fairly small pipe. It makes
8 a lot of sense, first of all, let me say that.

9 Let me ask Vitthal to explain what he's
10 done in trying to evaluate the frictional losses and
11 so forth so that you can have an understanding of
12 one of the changes that we implemented and what its
13 impact is in comparison to what we had before.

14 HOSANGADI: Basically, when we looked at the
15 depth that we are planning to test, which was
16 probably around 50 to 200 feet, rather than going
17 with one single casing for the entire depth, we
18 decided to break it up into three separate screen
19 intervals and be able to get a better feel for what
20 the flow rates were in the different zones.

21 Now, given the size of the borehole for
22 the casing, which would be around 8 inches, it would
23 be possible to put a 4- or even a 6-inch casing, but
24 we would only be able to put one of those. And if
25 you wanted to break it up into three, with regards

1 to the logical size to go with based on our
2 conversations with the driller was 1 1/2" casings and
3 anything more than that would be too crowded,
4 particularly in the first few -- first 100 feet or
5 so if all three casings would exist within that same
6 bore hole.

7 Then what we decided was, partly after
8 your comment, was to see what the actual numbers
9 were for the different casing. So we basically
10 looked at 1 1/2-inch casings, 2-inch casings and
11 3-inch casings and tried to see what the friction
12 losses would be for those different depths.

13 I've done some calculations here that I
14 can hand out. It looks like if you were to go with
15 the middle one and the deeper one, if you were to go
16 2 inch and keep the shallowest one at 1 1/2 inch,
17 you would be able to minimize the friction losses
18 during extraction. At the same time you would be
19 able to put all three casings within the bore hole
20 like we planned on. And also, we found that the
21 friction loss as you go from a 2 inch to a 3 inch,
22 the drop in the friction loss is not quite as
23 significant as the drop in friction loss when you go
24 from a 1 1/2 inch to a 2 inch.

25 BURIL: Let's hasten to add one aspect of this,

1 though. That is that this is just for this pilot
2 test. This is not the proposed installation of
3 full-scale extraction when we actually get to that
4 point. This is not the design that we're proposing
5 for it. This is just for this pilot test extraction
6 well.

7 HOSANGADI: Right. Basically to let them see
8 what the effects of pulling from different screens
9 would be. It might end up, for example, that the
10 full scale does use a single 4-inch well screen from
11 50 feet all the way to 200 feet because that ended
12 up being what the pilot test showed. Or on the
13 other hand, it might end up being that we have a
14 4-inch screen, but we start the screen only at, say,
15 100 feet as opposed to 50 feet. And these are all
16 questions that would be answered by the pilot
17 test -- but in order to answer those questions
18 effectively we need to have the ability to have flow
19 from three separate screens as opposed to just two
20 or just one, basically. And that's one of the main
21 questions that we are hoping to answer with the
22 pilot test.

23 BURIL: In all candor, what we're looking at
24 here, too, is we don't know that this is going to
25 work. We got a good feeling about it, but we don't

1 know for certain that it's going to work. And
2 installing the well as we're describing here is an
3 attempt at some cost savings in case it doesn't
4 work. When we ultimately go to a full-scale system,
5 should we find that the thing works well, the design
6 of the actual extraction wells will be different and
7 will incorporate the information that we generate
8 from this test to optimize all the flow
9 characteristics, not only in terms of the locations
10 within the soil column but also in terms of
11 engineering concerns of head loss and so forth.

12 CARLOS: Including the casing sizes.

13 BURIL: Including the casing sizes. That's
14 right.

15 HOSANGADI: I can actually -- a couple of extra
16 copies.

17 What I've done on this graph is, the first
18 three lines were basically for the 1 1/2-inch well.
19 Going from top to bottom, if 1 1/2-inch well were
20 used for the deepest, the middle and the shallow,
21 then the next three dashed and dotted lines are
22 basically if you were to use a 2-inch well, again
23 going from top to bottom, deep, middle and shallow.
24 And the three solid lines at the bottom of the graph
25 are basically if you were to use 3 inch.

1 And since we are basically having three
2 separate wells, we are expecting to see around --
3 see a flow rate of anywhere from, say, about 90 to
4 130 cfm or so from each 1 1/2-inch casing. And you
5 can see pretty easily that if you were to have a
6 1 1/2-inch casing either for the deepest or the
7 middle, let's just pick, say, 100 cfm for now, you
8 see that the friction losses for the deepest well
9 would be almost 100 inches of water and the friction
10 loss for the middle well would be almost 70. But if
11 you were to have it for -- the 1 1/2-inch well for
12 the shallow, your friction losses are only on the
13 order of about 20 to 30 inches of water for that
14 flow rate.

15 So based on that, we figured that it
16 doesn't make sense to use a 1 1/2-inch well either
17 for the deepest or the middle, but we could
18 potentially still use it for the shallow. And then,
19 of course, for the deepest or the middle, since it
20 doesn't make sense to use a 1 1/2-inch well we go to
21 the next size, which is 2 inch, and you can see that
22 obviously the friction loss is going to be less than
23 30. It will probably be around 20 and 15 or so.

24 So based on this graph and the fact that,
25 you know, we could possibly go with three 2-inch

1 wells because the top 100 feet would be extremely
2 crowded, we decided to go with 2-inch wells for the
3 middle and the deep and the 1 1/2-inch wells for
4 shallow.

5 So that way, the other advantage of that
6 is that there will be some amount of balancing of
7 the friction losses. So we won't have to play
8 around with the vacuums at the wellhead itself as
9 much as you would if you were to have the same
10 diameter for all three.

11 BURIL: Are you all able to follow the graph
12 reasonably well?

13 CHANG: We're trying to figure which is the two
14 inches and which is the --

15 HOSANGADI: Going from top to bottom the first
16 three are 1 1/2 inch. That's the complete dotted
17 line.

18 BURIL: Each one of those is inch and a half.
19 The next three are 2 inch.

20 CHANG: Okay. Got it.

21 HOSANGADI: And the bottom three are 3 inch.

22 CHANG: This is 3 inch.

23 BURIL: 3 inch is almost parallel with the X
24 axis.

25 BURIL: So the end result of that is that we're

1 able to minimize our operational difficulties in
2 terms of drilling by keeping the hole size
3 reasonable, being able to keep the sonic drilling
4 technique, which we know to work very well here, and
5 still minimize the friction losses that we
6 ultimately would see in trying to implement the
7 pilot test.

8 NIOU: What's the biggest driller pipe, or
9 driller bit?

10 BURIL: The biggest hole -- correct me if I'm
11 wrong, B.G., but the biggest hole we can get down to
12 200 feet is 8 inch with a sonic rig.

13 RANDOLPH: We can have a 9-inch hole for about
14 the upper 100 feet.

15 NIOU: Going down to 200 feet, 8 inch will be
16 more economical.

17 BURIL: You'd have to start at 9 and go to 8 if
18 you want it bigger at the top because they
19 physically can't do it any bigger down to 200 feet.
20 It has to be 8 inch, unless we went to an air
21 percussion or something like that. That's painful,
22 long term doesn't work nearly as well.

23 NIOU: Actually, if the soil is pretty sandy,
24 then the friction loss wouldn't be that critical
25 because you can directly apply your vacuum down

1 there.

2 HOSANGADI: Yes. If it ought to be truly sandy
3 then it's really the entire bore hole that is the
4 well. The 1 1/2 inch is only the conduit to move
5 that vapor. And that's kind of -- this analysis
6 holds true in that case as well. But even if you
7 were to have no soil whatsoever, this is about the
8 limit you can pull unless you keep on increasing the
9 vacuum, basically.

10 NIOU: Yes.

11 BURIL: You may very easily reach an asymptote
12 in terms of flow versus vacuum anyway.

13 HOSANGADI: Right.

14 BURIL: So those are the changes that we have
15 calculated out. And, in fact, Vitthal has given me
16 today his final draft for my review incorporating
17 these. So if this is something that you folks are
18 comfortable with, I can review through it knowing
19 that it will be all right and we can get this thing
20 out the door in a little shorter fashion.

21 Why don't we take a minute and let you
22 guys look at it and give me a chance to get a drink
23 of water.

24 CHANG: Thanks.

25 (A recess was taken from

1 11:09 A.M. to 11:24 A.M.)

2 BURIL: What do you think?

3 CHANG: It looks good. I really appreciate you
4 guys addressing our friction loss concerns, and I
5 think it will work without any problem.

6 BURIL: All right. Great. Then I can say that
7 we can have this thing out to you fellows as a
8 document here probably in the next week. It will be
9 in your hands for review.

10 NIOU: Okay.

11 GEBERT: Great. Great.

12 CARLOS: We'll give it a quick review so you can
13 proceed with your schedule.

14 BURIL: Well, this is a procedural thing. I
15 guess we should probably all understand and try to
16 figure out how we want to approach it. Under the
17 FFA this thing is being submitted as, I guess you
18 could call it, a primary document.

19 RANDOLPH: No. A secondary document.

20 BURIL: Is it a secondary document?

21 RANDOLPH: Yes. It's for treatability study.
22 Treatabilities fall under secondary.

23 BURIL: Okay. Thank you. I wasn't sure. All
24 right. I don't recall what the secondary document
25 review time is, but typically it's 60 days for

1 primary.

2 NIOU: 30.

3 BURIL: Is it 30 for secondary?

4 CHANG: Yes. It's normally 30.

5 BURIL: I would leave it to you folks to decide
6 how you want to deal with shortening that, given the
7 work that we've done up front. One opportunity that
8 I might suggest is that if you have opportunity to
9 go through it and then just -- if you don't find a
10 problem with it, rather than waiting for the time
11 frame to expire, is to perhaps just pen a quick
12 letter to us and say "It's fine as it is. Go with
13 it." If we get three of those letters from you
14 folks in less than the 30 days, then we've got the
15 green light, we're ready to go.

16 CARLOS: Less than 30 days.

17 BURIL: Let me suggest that as an approach to
18 deal with it, then.

19 GEBERT: Either that, or we could say it's
20 approved pending inclusion of a couple comments.

21 BURIL: That's assuming -- if you have comments,
22 then obviously we need to address those. Based on
23 what I'm hearing so far, it doesn't seem to me like
24 you're going to run into major things. So certainly
25 I think that kind of an approach would work very

1 well.

2 GEBERT: They would be probably minor.

3 BURIL: That's agreeable?

4 RANDOLPH: I would love to have you do that.

5 Anything to speed up the process to get the rig in
6 the field and get it reserved, because if we don't
7 have it pretty much on board within the next two
8 weeks and can pencil it in, we could lose it for as
9 much as two months.

10 CHANG: Since there's no major concerns from us,
11 definitely get the equipment out.

12 BURIL: I'll try to speed by getting it to you
13 here. I'll see if I can get it to you this week.

14 GEBERT: Yes. The quicker you get it to us --

15 BURIL: I'll put it on the top of the list.
16 That means both of us, actually.

17 Our review folks internally have already
18 looked at this and blessed it, basically, haven't
19 they?

20 NOVELLY: Yes.

21 BURIL: Since we're only dealing with technical
22 issues, I don't think it needs to run down the
23 chain.

24 Good. Peter, I'll have a copy to you this
25 afternoon. And pending your go ahead and our

1 review, I think we'll be in good shape.

2 ROBLES: Okay. I'll get on it.

3 BURIL: All right. This is actually working. I
4 like it. All right.

5 Number 4 on the agenda here was added at
6 James' request. James, I just wanted to find out
7 what it is that you wanted to ask or talk about on
8 this one and we can go from there.

9 CHANG: It's based on the letter that I faxed
10 you guys after our last conference call. I don't
11 know if -- Judy, I left you a voice mail.

12 NOVELLY: Yes. I got it.

13 CHANG: If you guys found the letter or not.

14 NOVELLY: No, I didn't find the letter.

15 BURIL: Which letter is that?

16 CHANG: Faxed it at the same time I faxed the
17 friction loss comment. And it was basically talking
18 about do you guys hold any type of radiation permit
19 or license. If yes, what was that specifically for.

20 BURIL: I remember you asking the questions on
21 the phone.

22 CHANG: And do you guys store any radiation
23 equipment. If yes, cite the type of equipment.

24 And the last thing was does JPL use any
25 radiation tracer elements for experiments conducted

1 on site. And if yes, what specifically is it used
2 for and what happens to the related waste.

3 BURIL: Fred would know every answer to that.

4 NOVELLY: Yes. And I talked to Fred yesterday
5 to let him know --

6 CHANG: Do you want to make a copy of that?

7 NOVELLY: -- that we'd give him a copy.

8 ROBLES: What kind of radiation survey are you
9 talking about? For environmental? Groundwater?
10 Environmental groundwater?

11 CHANG: Yes. This is for our radiation section.
12 They just want to know if there's any type of
13 radiation concerns they need to address here. So
14 that's the generic stuff they had given me on the
15 voice mail, so I just put it together.

16 ROBLES: The question is do you mean ionizing or
17 nonionizing radiation sources?

18 CHANG: They didn't specify in the voice mail to
19 me.

20 BURIL: I would assume they're meaning ionizing.

21 ROBLES: You're not talking about lasers.

22 CHANG: I don't believe they're talking about
23 lasers at all.

24 ROBLES: The only other kind of radiation we're
25 talking about would be that which is on the

1 spacecraft. Is it that information you guys need to
2 know, too? Or are you just talking about
3 environmental?

4 CHANG: It's only environmental concerns on
5 site.

6 BURIL: Let me pass along to you some -- Peter
7 has got a good point here because things such as
8 RTGs, radioactive thermal generators --

9 ROBLES: Which go on the spacecraft to provide
10 power and heat. That falls under the NRC. We don't
11 own this stuff. That goes on the spacecraft and
12 then it goes up in space and that's it.

13 BURIL: There's all kinds of it on Cassini right
14 now and it's about three-quarters of a billion miles
15 away.

16 ROBLES: That's the only way we use radioactive
17 material here.

18 BURIL: We have a few low-level sources that are
19 used for a variety of experimental purposes not
20 dealing in terms of environmental, but it's dealing
21 in terms of other research type things, instrument
22 development, microsensors and things of that nature.

23 You were saying you talked with Fred
24 yesterday?

25 NOVELLY: Yes.

1 BURIL: He's our radiation officer.

2 NOVELLY: And I let him know we'd have some
3 questions.

4 ROBLES: That's why I'm wondering, James, in the
5 context of the question you're asking, is it
6 environmental like Superfund groundwater or it's
7 just total radiation under the radiation
8 auspices, because NRC is responsible for radiation,
9 not EPA.

10 CHANG: Well, see, your case is kind of unique
11 in the radiation survey because most of the surveys
12 are basically concerned with closing bases, you
13 know, they're going to vacate the land and therefore
14 there's a big concern on what's going to be left
15 over. You guys are going to be a continuous open
16 facility. So I think the concern is a little bit
17 different here, you know.

18 BURIL: I don't think that we've got any concern
19 with sharing the information. We'd kind of like to
20 understand what the information would be used for.

21 ROBLES: My problem is this, James. I've been
22 through these kind of surveys before, when I was in
23 the Air Force. You send the information to OSHA,
24 you send the information to NRC and you send the
25 information to the EPA. It looks like we are

1 dealing with triple the amount of radioactive
2 material here, because they don't understand it's
3 the same information. So that's why I'm very much
4 concerned about it. I don't want to appear --
5 because you know when you get over that threshold,
6 bells and whistles go off and then we got the NRC
7 coming in here looking at why you have so much
8 radiation material. It's just one report that's
9 been duplicated three times because three regulatory
10 organizations wanted it.

11 CHANG: No, I don't believe our radiation folks
12 are trying to go beyond the bounds of what NRC
13 regulates. That's not their mission here.

14 ROBLES: Okay.

15 CHANG: They just want to make sure they don't
16 have any environmental issues that they got to be
17 concerned about or have to address.

18 BURIL: That's fair. I don't see that as being
19 an issue. I can answer a couple of these questions
20 right off the top of my head.

21 Does JPL hold any type of radiation permit
22 license? Yes. We do. We have one from the NRC.

23 ROBLES: Yes.

24 BURIL: And do we store any radiation equipment?
25 Well, that's kind of a broad answer, or question.

1 We have Geiger counters. We have X-ray machines.
2 We have low-level sources. We have complete
3 inventories of all of that stuff that actually
4 contains a source.

5 ROBLES: We know where it's at.

6 BURIL: If that's the kind of information that
7 you'd like, we can get that to you.

8 ROBLES: We have all that in a database we can
9 get to you.

10 BURIL: So if that's the kind of information
11 you'd like. Is it inventory of the sources we have
12 on site? Is that sufficient to answer the second
13 part of question 2?

14 CHANG: I think so. If you can just simply spit
15 out that inventory list so I can just give it to the
16 radiation folks, that's all you've got on site,
17 that's it, it's just a closed case.

18 BURIL: The third question, "radiation tracer
19 elements for experiments conducted on site." Can
20 you explain to me what that means, because I guess
21 when I see the word "radiation tracer elements," I'm
22 thinking of something that's inserted into the
23 environment.

24 ROBLES: There's two, maybe three areas, but go
25 ahead.

1 RANDOLPH: I was going to suggest tritium is a
2 groundwater tracer, if we were doing something of
3 that nature. But definitely not.

4 ROBLES: Then also you have the micros labs,
5 where there are tracers that are maybe used in
6 developing chips.

7 BURIL: I'm aware of all those. That's why I'm
8 asking if there's a distinction you're trying to
9 draw. If we are introducing a tritium tracer into
10 the groundwater in order to trace its pathways and
11 so forth, that's one aspect. If we're talking about
12 a tracer that we might use to understand how we're
13 developing a microscopic circuitry board, that's a
14 different kind of thing, which really isn't an
15 environmental issue per se.

16 What aspect of that, if there is a
17 distinction, do you want to see? Or are you making
18 a distinction?

19 CHANG: I think it's more of the second aspect.
20 And in dealing with that, then, you know, they're
21 looking, okay, is there any environmental effects
22 from that. It doesn't sound like there is.

23 ROBLES: No.

24 BURIL: I see.

25 ROBLES: See, those would be very hard to track

1 because those cases, whenever there are experiments,
2 they do have what they call safety operational
3 reviews. And basically, they have to go through a
4 whole process through the safety mission assurance
5 division here to ensure that any types of research
6 done conform within those guidelines.

7 Also when a spacecraft is done, they've
8 got to go through a lot of QA/QC of spacecraft
9 requirements. Our safety hardware and safety
10 research programs are second to none because if
11 there's a fault out there, they're going to come
12 back and find out who is at fault. That's why
13 review is focused on heavily. We have a whole
14 division. We have institutional safety and then we
15 have flight safety. That's how important it is for
16 us here.

17 But the key question is if you want to
18 know like a database for tracers, I don't think it
19 exists. We're talking about very small levels and
20 I'm talking about a subatomic particle where you do
21 one of a kind of thing.

22 BURIL: Whatever we might do in this would be
23 extremely limited, I'll say that.

24 ROBLES: It falls under the NRC level. Because
25 once you get to a certain level in the NRC

1 requirements, they don't even consider it important.
2 It's not a big deal.

3 BURIL: If we have the information, James, we're
4 more than happy to share it with you. Where we get
5 that and how long it will take us to get it is
6 something that we'll have to see.

7 In terms of the first one and the second
8 one, the answer is very quick, very easy and we
9 should be able to respond to that fairly rapidly.
10 The third one may take some more time only because
11 if you're talking about does JPL use any radiation
12 tracer elements for experiments, is this currently?
13 In the past? Both? Plans for the future?

14 ROBLES: Fred would know. Because if the tracer
15 elements are significant enough, Fred would have to
16 know and if they weren't, they would always
17 coordinate. He has a pulse of what's going on.

18 BURIL: He's been here -- the fellow we're
19 talking about is Fred Sanders.

20 CHANG: I have a suggestion. Why don't we let
21 Fred talk to my radiation support staff.

22 ROBLES: Sure.

23 CHANG: Those guys can decide what they need
24 from each other.

25 BURIL: That's fine. They can certainly speak

1 more intelligently about this, I'm sure, because I
2 certainly have limited knowledge on this.

3 ROBLES: I think we can answer all the questions
4 very satisfactorily to your people.

5 CHANG: What's that gentleman's name again?

6 ROBLES: Fred Sanders.

7 BURIL: Let me offer this for you, James. Let
8 me contact Fred. He happens to be one of the guys
9 who hired me here about seven years ago. I eat
10 lunch with him just about every day. Let me tell
11 him what it is that you're looking for and I'll give
12 him a copy of your letter and see if we can arrange
13 to get your radiation guy and him together and I'll
14 act as the kick-off board with Fred on this end.

15 CHANG: Okay. All right. Because I'm only
16 serving as a messenger here.

17 ROBLES: I understand. I understand.

18 BURIL: The best thing I know about radiation is
19 stay away from it.

20 CHANG: That's my philosophy.

21 BURIL: Okay. Great.

22 That brings us up to Other Items.

23 Amazingly enough, I don't know how I managed this,
24 but somehow we left off the agenda the discussion on
25 the next phase of characterization for the vapor

1 study. And I know that in our last teleconference
2 there were some expressions of concern regarding the
3 location of the wells, possibly the number of the
4 wells that we had identified.

5 And so with all of us here in the room,
6 what I'd like to do is revisit that for a few
7 minutes and hear what the concerns are once again.
8 We have a map here now that we can look at and maybe
9 compare what your thoughts are to what we had
10 initially thought of and see how they mix and match
11 and maybe be able to resolve some of those concerns
12 that were identified.

13 Stephen, do you want to start this? As I
14 recall, you had a few there.

15 NIOU: No. I think I already -- all my thoughts
16 are already in the letter that sent to him and
17 already received those, my comments.

18 BURIL: For?

19 NIOU: Oh, to the points. Also, I asked him
20 already today. The location of these. I feel
21 they're kind of far away, but B.G. saying the
22 original goal was to delineate the whole area, try
23 to find at least, and I say great.

24 BURIL: So you're comfortable now with the
25 locations in terms of that goal?

1 NIOU: Yes. If that's your objective, then of
2 course, go ahead.

3 BURIL: That's basically what we're trying to
4 do. We're trying to understand how big an area
5 we're dealing with here that might need remediation.
6 We might want to do some fine tuning further on into
7 this.

8 NIOU: Yes.

9 BURIL: But as an outset, knowing what the area
10 in terms of its extent is what we might want to be
11 looking at for our remedial action was kind of the
12 thrust of this, because knowing that information,
13 coupled with the SVE work that we ultimately
14 complete, then we have enough information to start
15 talking about a design. And that's really the
16 thrust of this at this point.

17 We may want to do some fine tuning
18 depending upon what we find with the SVE work. If
19 we find that the radius of influence is very small,
20 then certainly placing wells every 25 or 30 feet
21 isn't really something I think we want to do. But
22 if it turns out to be what we expect, it might be in
23 the number of hundreds of feet, then the approach
24 that we're taking at this juncture I think might
25 make more sense. Okay.

1 GEBERT: I think it's a good plan. The only
2 reservation I have is there is no probes in the
3 eastern part of the site there. I think on the
4 telecon we talked about it and I --

5 ROBLES: This here?

6 GEBERT: No. More on site. Yes. Right there.
7 Right in that area there.

8 BURIL: B.G., do you want to explain --

9 GEBERT: I think there was -- some of the older
10 soil vapor surveys they had some hits in the
11 shallower probes.

12 BURIL: Here is the man that can tell us all of
13 the good stuff.

14 GEBERT: I still don't see why you do not want
15 to put a probe there on the east at least to see if
16 there's any deep vapors.

17 RANDOLPH: Groundwater is about 35 feet here.
18 We don't know exactly what it is in here, but it's
19 probably around 70 or so. We know groundwater is
20 less than 100 down in this area from those other
21 holes we put in last spring. MW-12, I don't have
22 the information on it at this point in time. We
23 have soil vapor wells in here, here, here that are
24 100 feet deep. And that data has been presented.
25 They're very, very low levels of anything that we

1 had picked up.

2 BURIL: I think the point, Richard --

3 RANDOLPH: We had water here. And here --

4 BURIL: These are all very close to the water
5 table.

6 RANDOLPH: -- these are very shallow.

7 GEBERT: That's fine. I wasn't aware of that,
8 that you had gone down to the water table.

9 BURIL: We're right on the cusp.

10 RANDOLPH: We didn't hit the water table, but
11 we're within a matter of feet from it. Based upon
12 the information we know where water is in through
13 here and the depth in here, we're 95 feet, 96 feet,
14 somewhere in there. That data is available.

15 GEBERT: I've never seen that data.

16 RANDOLPH: I know Penny had it.

17 ROBLES: We're not going there.

18 BURIL: No, we're not. No one's going there.

19 GEBERT: She didn't keep everything, I think,
20 that was given to her. I have most of it, but I
21 don't recall having any hard data. If you could
22 give me a copy.

23 ROBLES: B.G., could we get him a copy?

24 RANDOLPH: Sure. I don't have it with me.

25 BURIL: We already have that in a tabular

1 format. We'll just gem up a --

2 GEBERT: Just send me a copy of that. It's one
3 of the concerns I had. I didn't see any new data
4 there.

5 ROBLES: We did a lot of research here.

6 GEBERT: Right. I know there was some done, but
7 I didn't --

8 RANDOLPH: That's where all the seepage pits,
9 the majority of the seepage pits were. That's where
10 our main interest was at the time. We were trying
11 to get every one we possibly could, or get as close
12 to them as we possibly could.

13 BURIL: Well 12.

14 CUTLER: Screen 1.

15 BURIL: Well 12. Reference elevation is 1100.
16 Water level there was NW.

17 CUTLER: No water. It was below the screen. So
18 maybe look at --

19 BURIL: Second screen at 948. Let's look at
20 number 11. Reference elevation there was 1140, and
21 the water elevation was about 1115 -- excuse me.
22 1015. So you're about 100 feet difference at that
23 particular location.

24 CUTLER: And that's low water. When screens
25 start going dry, it's really low. It's unusually

1 low.

2 BURIL: This is kind of interesting this time of
3 year right now because what you're looking at from
4 this level, from the September time frame, is
5 basically the bottom of the curve as it's going
6 down. You don't get much lower once you get past
7 October, do you, Mark?

8 CUTLER: No. It's low.

9 BURIL: Let's just look at it for October, the
10 end of October for the same well. For MW-11 it went
11 up about a foot. So it was just a little different
12 there.

13 And MW-12 still showed no water at that
14 first screen. So you were at that bottom end of it.
15 And I think if we went back historically and looked
16 at it, I think B.G.'s numbers I recall as being
17 correct. That's why we designed those vapor wells
18 at that depth, was to just come down, just touch the
19 cap zone, maybe just a bit above it. We're even
20 lower now than we were in the mid '80s, aren't we?

21 CUTLER: This is the lowest we've ever seen it
22 was during that event. But it's been eight years.

23 ROBLES: This is our lowest water table event.

24 CUTLER: The lowest we've ever measured on this
25 site.

1 ROBLES: And with the rains --

2 BURIL: Well, if El Nino keeps kicking in.

3 CUTLER: This last sampling event we still had
4 one screen that was dry. So I think in the grand --
5 this was as of a week ago.

6 NIOU: 20?

7 CUTLER: We're still relatively low compared to
8 historically.

9 BURIL: Which well was that, Mark?

10 CUTLER: That was Well 18.

11 NIOU: Oh, 18, not 20.

12 CUTLER: The off-site well.

13 NIOU: Off site.

14 CUTLER: When we started sampling I believe Well
15 12 still was at no water. By the time we -- it
16 takes about five weeks.

17 ROBLES: You're saying by the late spring
18 because of El Nino we might start seeing dramatic
19 rises.

20 CUTLER: It should. It really didn't start
21 raining down where we live until February. If it
22 was the same here, it will take it a while before we
23 really see it in the wells.

24 BURIL: The impacts that you see as a result of
25 the rains really are minimal in comparison to the

1 impacts that we see as a result of the spreading
2 that goes on. The spreading just started here last
3 month.

4 ROBLES: And they should be continuing spreading
5 all the way.

6 BURIL: If they have the water backed up there
7 like I think they do, it will be going all the way
8 until June or July. That's what happened in -- when
9 was that, '91 time frame?

10 CUTLER: Yes. It was almost year round.

11 ROBLES: And that spreading basin provided a
12 barrier to the Pasadena wells.

13 BURIL: So basically what -- somewhat, yes.

14 CUTLER: Right. Exactly.

15 GEBERT: Maybe.

16 CUTLER: Typically, end of March and April are
17 usually our high water mark.

18 BURIL: Then you get into the withdraw periods
19 that the water purveyors start utilizing the water
20 that's built up over the course of time and then
21 they start drawing it down again.

22 To address your question, Richard, I think
23 the biggest thing to remember is that when we were
24 designing these things, we designed them to be
25 usable at peak level and that when they drop off,

1 naturally it's going to fall below that level, but
2 then it's going to come back up again.

3 GEBERT: Come back up.

4 BURIL: As far as an ability to do anything with
5 vapor in that region it's going to be essentially
6 not very doable because it's going to be saturated
7 half of the year.

8 RANDOLPH: I'd like to add one other point
9 regarding the location here of 20 and 28, soil vapor
10 wells. MW-11, which is here, we felt that we would
11 make 100 feet in these holes. We got stymied by
12 boulders in one hole so we had to back off and drill
13 a second time. But we believed at that time water
14 was at least 100 feet deep or more. We got flooded
15 out at 69 feet. We started making water. We had a
16 water well. So that's kind of a dramatic increase.
17 We were totally surprised.

18 CUTLER: We could see seasonal changes of up to
19 60 feet.

20 GEBERT: I wasn't aware of that.

21 BURIL: What did we see, one fluctuation one
22 year was pushing almost 90 feet in one well?

23 CUTLER: Yes. If you look across the
24 hydrograph. From the high high to the low low it's
25 probably more now with this year's low. It was

1 about 90 feet. 60 is a good average. But I bet we
2 set --

3 BURIL: We have a new record now.

4 CUTLER: It's past 90 now because of the low
5 low. Yes.

6 BURIL: That's possible. Does that help,
7 Richard?

8 GEBERT: Yes.

9 BURIL: Great.

10 ROBLES: Let's make sure we get the information
11 to him.

12 RANDOLPH: Right. That will be no problem.

13 I'd like to reiterate one other comment --

14 BURIL: Sure. Go ahead.

15 RANDOLPH: -- that was made in the past
16 regarding the three step-out wells that we had here
17 out from 25 or 16, which is now 25. We have another
18 one here, which is 26. 28 is right here in front of
19 Building 18. We have one up here right in the
20 corner of the parking lot, which is boring 27. And
21 at that time we felt that we were stepping out too
22 far and thought that they would probably be
23 indicative of where vapor wasn't. So we were told
24 that we had to make a statement in the addendum to
25 the FSAP and workplan. I'm sorry, your predecessor

1 made us do that.

2 But anyway, we are stepping out farther
3 now, but we want to get our arms around it because
4 those other three holes were actually hotter than
5 the original hot spot that we had.

6 BURIL: Basically, we realize that there are no
7 absolutes on this thing. We thought there would be
8 absolutely no way we could have anything that big
9 when we put out those step-out wells. Boy, were we
10 wrong. So we're going even further out.

11 RANDOLPH: I kind of felt that we'd be on the
12 fringe.

13 BURIL: Okay. Well, if there's no concerns
14 regarding the locations of these and the number of
15 them now, based on the comments that we have so
16 far --

17 RANDOLPH: We might want to review the rationale
18 for those four westernmost holes again just to
19 refresh everybody's memory, because they were based
20 upon the contaminants that were found in the
21 groundwater at MW-13 and 16.

22 BURIL: Yes. That's basically it. The concern
23 being that with the TCE and so forth being present
24 in Well 16 and 13, we didn't have enough information
25 in the western portion of the site to really

1 understand what it was that might be influencing
2 that area.

3 NIOU: But was Well 22 clean?

4 BURIL: Well 22 is almost clean. So what we're
5 trying to do is we're trying to delineate the area
6 we're dealing with in terms of the vapor potential.
7 If you look at the distance between 13 and 22, it
8 just about splits it. So we're trying to understand
9 what we might be dealing with in terms of a remedial
10 design here.

11 Again, depending upon what we find out
12 with the SVE test, we may want to fine tune some
13 information that's provided by these wells to maybe
14 focus a little bit more on the areas where we might
15 want to emphasize remediation for vapor extraction.
16 But we're real hopeful that this time we'll hit it
17 right and we won't have a large area, we won't
18 basically stay within a hot zone, we'll actually
19 have expanded out and delineated this area. And
20 based on that, we can decide what we need to do to
21 deal with it in terms of remediation.

22 CARLOS: This additional deep vapor well, do you
23 plan to go all the way to capillary?

24 BURIL: Yes.

25 CARLOS: That's also true for 26, 27 and 28?

1 BURIL: That's correct.

2 ROBLES: Do you think we have enough information
3 to start designing?

4 GEBERT: Hard to say. Depends what the
5 results --

6 CARLOS: Depends what the results.

7 BURIL: Like I said before, Pete, if we get to a
8 point of saying that our radius of vapor influence
9 is only in the neighborhood of 50 feet around a
10 given well, that's an awful lot of number of holes
11 to put in the ground to try to deal with an area
12 this large. We may want to then begin to divide up
13 this larger area into sections and look at it and
14 maybe eliminate sections as we go along. If we're
15 talking about something where we can actually get a
16 radius of influence of maybe 150, 200 feet, that's a
17 whole different scenario.

18 ROBLES: That's going to be tough.

19 BURIL: We don't know. That's what we're asking
20 Vitthal to figure out for us.

21 ROBLES: I am anxious to start getting into
22 design and start pressing on this because we've been
23 studying the site too long.

24 CHANG: I can understand that.

25 GEBERT: I don't want to argue with you.

1 BURIL: No, not at all. Up until perchlorate
2 showed up, we were ready to go to interim
3 remediation here on site.

4 Richard, you were here. Stephen, you were
5 here. Alex and James didn't show up at this
6 particular time. I recall we were ready to go to
7 ROD on Operable Unit 3. In fact, we even generated
8 a schedule that said how we would do it and almost
9 had it approved, and suddenly perchlorate showed up.

10 CUTLER: You had given us funds to write the
11 OU-3 RI.

12 BURIL: I know.

13 CUTLER: And that was back in '95.

14 BURIL: It was just one thing after another.
15 Mother Nature has a bad habit of giving us reality
16 checks every now and then.

17 All right. Then I guess we're down to
18 Other Items. I had anticipated more discussion on
19 items 3 and on the other one. But this is great. I
20 mean, this is absolutely fantastic.

21 Is there anything else anyone wants to
22 bring up before I go through the old list of action
23 items and such?

24 GEBERT: I have one administrative or financial
25 item for you, Chuck. For some reason we haven't

1 been getting paid for the last quarter and I don't
2 know if it's a -- I have a feeling that our invoices
3 have been going to the wrong person rather than JPL
4 not wanting to pay our cost.

5 BURIL: Oh, no. Nancy Waller is the right lady.

6 GEBERT: Is she still the --

7 BURIL: She's the right lady.

8 GEBERT: Those copies are for you.

9 ROBLES: I signed a whole bunch of them.

10 BURIL: Yes, I know. I got one --

11 GEBERT: That's a copy of the latest invoice.

12 BURIL: I'll look into it, Richard. That's all
13 I can tell you. I'm kind of chagrined, actually. I
14 thought we were doing pretty good with you guys
15 because you gave us all the backup. I mean, you
16 guys are easy to deal with.

17 GEBERT: I got a copy of that letter --

18 BURIL: And the Regional Board has now got
19 everything going well, too. So it works well.

20 ROBLES: What happened?

21 GEBERT: So if you'll check up on that, Chuck.

22 BURIL: I certainly will. I'll be pleased to.

23 GEBERT: Because I got a copy of that letter and
24 so I was asked to look into it.

25 BURIL: I will check it out immediately.

1 ROBLES: I signed a whole bunch of them last
2 month. Maybe the check has been going to the wrong
3 place. Did you change address?

4 GEBERT: No, I don't think so.

5 ROBLES: I signed those things.

6 BURIL: I just signed one that I'm going to send
7 to you this morning. In fact, I was going to drop
8 it off with you. I've got the Regional Board for I
9 think it was the first half of '97. And all the
10 back-up is there. Everything is there. I'll check.

11 GEBERT: Okay.

12 BURIL: I will check. I don't know. All right.

13 CHANG: I got a couple of administrative items
14 if we're all done.

15 BURIL: Sure.

16 CHANG: I've been trying to get Steve to give me
17 a hand to try to figure out where exactly are all
18 the contamination problems based upon the phone
19 calls I've gotten from Raymond Basin. And also, I
20 try to stay away from your community relations
21 problems, but I'm getting sucked into it here.

22 BURIL: Can you share with us how that's
23 happening?

24 CHANG: Yes. I had a conference call with James
25 Rogan, your Congressman's office. And their concern

1 is based upon this Foothill Municipal Water District
2 letter. I don't know if you guys got a copy of this
3 already.

4 BURIL: Is this the one requesting funding
5 assistance?

6 CHANG: Yes. I also had a follow-up
7 conversation with Raymond Basin on this, too. What
8 Raymond Basin was telling me was no more than what
9 you have already shared with me. They're pushing
10 for bucks. That's the bottom line.

11 ROBLES: They're looking to you, they're looking
12 to the City, they're looking to the Water Board.
13 They got really riled that we're paying you guys and
14 they're not getting any money. They want oversight.
15 I told them basically that NASA, and we had a
16 discussion with them about it, that NASA doesn't
17 feel that it should be paying them and you guys to
18 oversee the project without an FFA. And if we got
19 to sign an agreement with them, then what does this
20 mean with what we have with you?

21 They didn't like that. They just want
22 money. They don't want to sign anything.

23 CHANG: So what Rogan's office's main concern
24 was, is everything that can be done being done as
25 far as addressing the contamination problems at JPL.

1 BURIL: When they say "the contamination
2 problems," is there any specificity regarding what
3 aspect of contamination they're talking about?

4 CHANG: Well, they of course are being pushed by
5 this letter that was written to them about the
6 perchlorate issue. But I'm sure later on, as your
7 suits come more on line, there's going to be more
8 interest other than perchlorate.

9 BURIL: Sure.

10 CHANG: So what I'm trying to do right now is
11 just trying to establish what are all the
12 contamination problems here off site of JPL. And
13 that's what Steve is trying to get together for me,
14 is the information that DHS may have, the Water
15 Board may have versus what you may have.

16 ROBLES: Let me go through a little bit because
17 I've been very intimately involved with Raymond
18 Basin Management Board.

19 The congressman has been pushed because
20 the opinion of the Raymond Basin Management Board is
21 that all of the Raymond Basin is the responsibility
22 of this Superfund site. NASA takes exception.

23 So it needs to be clearly articulated when
24 you talk to Congressman Rogan, that the issues and
25 concerns of the JPL site have been taken care of.

1 The key is the off site, as you correctly surmised,
2 is where the issues are for the Raymond Basin
3 Management Board. Particularly, they want the
4 government to fund perchlorate studies across the
5 whole Raymond Basin. They have concerns. They do
6 not recognize there is delineation between the MWD
7 background levels that come out of the Colorado
8 River and other sources that are not just solely
9 from JPL.

10 Secondly, they're looking at the pumping
11 activities so, that these activities do not that
12 exacerbate the problems with the perchlorate. More
13 importantly what they want to do is to be able to
14 learn how they need to pump so they do not cause
15 major problems for themselves in the delivery of
16 water to their clients.

17 Thirdly, they are concerned about other
18 contamination issues out there, for example, PCE,
19 which Valley Water, I believe, is concerned about
20 because it's not present here on Lab. It's a
21 concern that they have and they don't know how to
22 deal with it.

23 BURIL: Nitrate is becoming an increasing
24 concern in the basin.

25 ROBLES: Right. Many of the purveyors of water

1 downstream past Pasadena and Lincoln Avenue are
2 starting to look to us and say "Why don't you deal
3 with us because our problems are your problems too?"
4 We're saying "Wait a minute. Perchlorate all the
5 way down Rubio Canyon and Los Flores, I don't think
6 so."

7 BURIL: Let me give you a perspective on where
8 that's at. These are the Los Flores wells down
9 here. Rubio Canyon on the scale of this map is out
10 to about here. And all our indications are based on
11 this apparent direction of groundwater flow and so
12 forth. And the levels we see here and here and our
13 MW-20 is that our zone of influence doesn't extend
14 anything beyond this area.

15 CUTLER: Our Well 20 was placed between JPL and
16 the Los Flores and Rubio Canyon wells for that very
17 purpose. I think we detected perchlorate in the
18 upper screen at 5 one time.

19 ROBLES: Their belief is that this is a
20 government issue and we represent the government,
21 that we should be funding them for this. The
22 conflict between paying you regulators and the
23 Raymond Basin Management Board for oversight is a
24 problem. Are you guys ready to relinquish your
25 Superfund responsibility so we can pay them? That's

1 the word I get from NASA headquarters. But I know
2 you guys -- you can't, by law do that.

3 CHANG: I can't do it by law. You're right.

4 ROBLES: And so their biggest concern is, and
5 I've advised them to talk to you guys, funding.
6 They want to do this and they're pushing their
7 congressman to do this.

8 So the key question is twofold: On site
9 and off site. On site and any areas of impact off
10 site that we cause, we are responsible.

11 BURIL: I'll share with you, and Stephen, I've
12 been hunting down additional information as you
13 asked me to. The only thing that I have is what I
14 think I've already shared with you, and that's the
15 database. Did I give you a copy of that?

16 NIOU: Not yet. I haven't got that.

17 BURIL: Come down to my office. I'll give you a
18 copy of it.

19 NIOU: Okay.

20 BURIL: Basically, I've got data leading up to
21 about 1995 time frame.

22 NIOU: Oh, that one, I already got Jon's two
23 years ago. Sent one to me also a spreadsheet, Lotus
24 spreadsheet that has many, many wells, all the
25 Raymond Basin. I got that one.

1 BURIL: That's all I've got. In fact, I haven't
2 even got that one that Jon has. That would be kind
3 of nice to have.

4 CUTLER: That might be a good one to get.

5 NIOU: Lotus? That's easy. That's still in my
6 computer. All I have to do is e-mail that to you.

7 BURIL: That would be great if you could. I'd
8 appreciate that very much.

9 ROBLES: The other thing, James, is the final
10 thing they're looking at for the study is how to
11 manage their water resources here, what the issues
12 of contamination are, and ultimately the impact that
13 it will have in the conjunctive use concerns.
14 That's their number one problem right now. They
15 want to be able to have the MWD conjunctive use
16 program implemented here. They see that as a saving
17 grace for them.

18 NASA is concerned that to use Superfund
19 monies for water management is improper use of
20 funds. I've looked at it every which way and I've
21 talked to NASA headquarters, I've sent them letters,
22 I've sympathized with them and I've tried to put
23 them on to you guys because they're looking for
24 funds. That's the big issue.

25 BURIL: I think that also there's some concerns

1 in terms of the way that they're viewing the issue
2 here within the Raymond Basin, as you, Pete, pointed
3 out. There's a phrase that's used within a proposal
4 from one of their consultants that always strikes me
5 as being very interesting. And the phrase was put
6 bluntly that JPL is obviously the source of the
7 contamination problem in the Raymond Basin,
8 particularly in terms of perchlorate. That's not a
9 quote, but that's about as close as I can get.

10 CHANG: That's what the letter basically says.

11 ROBLES: Right.

12 BURIL: So from that standpoint it appears to me
13 that they aren't particularly interested in
14 continuing with research such as we've done to
15 delineate what is actually our problem. They've
16 already made the decision. And because of that,
17 they are approaching us as the people who are at
18 fault rather than someone who has an equal concern
19 to work with them. And that's unfortunate. They've
20 so far worked fairly well with us, but continuing
21 concern such as this is bound to come up to your
22 level and, Richard and Alex, you're likely to see
23 it, too, at some point in time.

24 ROBLES: I've tried to work with them from the
25 standpoint of if there's something that we can do

1 within the scope of the Superfund here to help
2 understand what we're doing as impacting to what
3 they are doing in water management. One of the
4 things we've been doing is sharing information with
5 the City of Pasadena and MWD and water modeling so
6 that we can share information and understand studies
7 that can be incorporated within the Superfund
8 process. I have go-ahead from NASA headquarters to
9 support that.

10 But what they're asking is a study for the
11 whole Raymond Basin. And that basically flies in
12 the face of what we're required to do
13 congressionally from NASA. And I went and asked for
14 that funding to the NASA headquarters people because
15 I had to ask for the Raymond Basin. And they
16 basically said, as I told you, that unless you
17 regulators are ready to give up your responsibility,
18 they can't do it. It's that simple.

19 And they also want a piece of your
20 funding. Their comment is "What have you done for
21 them for the amount of money NASA is paying you?"
22 So be ready. And I've sent them copies of the
23 vouchers and how you list all your items so that
24 they can see that you guys are doing an effective
25 job.

1 But they really question it. They said
2 "What have you done for us for the amount of money
3 that we pay you?" So you may get a call from them.

4 GEBERT: All right.

5 CHANG: So anyway, the bottom line is I'm just
6 trying to get all the facts but try to be a neutral
7 party.

8 BURIL: Sure.

9 CHANG: So that Raymond basin doesn't try to
10 ramrod anything down.

11 BURIL: I think that one thing that you might
12 find is that they don't want you to be neutral.

13 CHANG: Yes. I get that feeling already.

14 ROBLES: They don't realize what they are asking
15 for. They're really asking that the whole Raymond
16 Basin become a Superfund site. I don't think they
17 realize what that means. But they think that it
18 means that they'll get all the funding they need.
19 And I don't think they realize they'll lose control.
20 That's a big problem.

21 And what they're looking for, quite
22 honestly, and I don't blame them, is they want the
23 funding without all the encumbrances that come with
24 it. They basically don't want to sign an agreement.
25 They don't want all the regulatory oversight. They

1 just want to be sent the money and be left alone.
2 That's what they're looking for.

3 So if you got any war chest, or petty
4 cash.

5 BURIL: That's a great example.

6 ROBLES: I read that article.

7 BURIL: Oh, did you? That's a great example.

8 CHANG: Okay.

9 BURIL: If we can help you in some way, let us
10 know, but we're not sure how.

11 CHANG: I'm sure I will later on down the pike,
12 as soon as I get all the information gathered, I'll
13 come back to you.

14 ROBLES: I would also recommend is get with the
15 Raymond Basin Management Board by yourself and just
16 sit down with them. They're very nice people to
17 talk to. I mean, they'll not yell and holler at
18 you. And they can articulate their needs.

19 BURIL: They're actually very cooperative with
20 us.

21 CHANG: I've already been invited to several of
22 their closed-door meetings, but I said not until I
23 get my data so I understand what's going on first.

24 Another administrative item, there's a big
25 push by President Clinton to close out some of the

1 Superfund sites. Like his goal is like 900 some
2 sites or something by the two year 2000, 2001.

3 BURIL: What does "closed out" mean?

4 ROBLES: Yes. That definition has been tossed
5 around. "Closed out" means what? You mean you get
6 to remedial construction and now you're in long-term
7 monitoring, that's considered close-out?

8 GEBERT: I interpret it to mean the
9 implementation of ROD.

10 BURIL: So you've completed ROD and you're up to
11 implementation.

12 GEBERT: Not total clean, but at least implement
13 the ROD. Completed the investigation, made a
14 decision, now it's running. That means it's done.

15 BURIL: Does he happen to have a perchlorate
16 solution in the back of his pocket there that we
17 don't know about?

18 ROBLES: And any new chemicals that come up?

19 CHANG: Anyway, so one of the things that I told
20 the Air Force folks is, I don't think realistically
21 we can have give a, quote, final close-out date for
22 JPL because of the perchlorate issue. But they
23 still want me to throw a date out there. So I was
24 going to throw out --

25 BURIL: January 11, 2021.

1 CHANG: -- I was going to throw out 20 years
2 from now.

3 BURIL: That's when I retire.

4 ROBLES: You hope.

5 BURIL: If I'm not retired sooner. Right?

6 ROBLES: He really needs a realistic date. I
7 know what he's forced into.

8 BURIL: I know. I'm just kidding.

9 ROBLES: I mean, you're going to have to put a
10 date.

11 CHANG: We've got to come to as sane a date as
12 possible. We realize it's just a planning date, but
13 it changes.

14 ROBLES: Well, James, I've been in the military
15 long enough and at NASA long enough. You got to
16 make sure that date is way out there --

17 CHANG: Exactly.

18 ROBLES: -- because if you give it too short,
19 you can never move it back.

20 CHANG: I don't want to be conservative on this
21 one.

22 ROBLES: It's like an action level. If you make
23 it too low, you can never raise it.

24 CHANG: I would rather have a far out date and
25 be able to beat it than in a sweat, you know.

1 BURIL: It's always a situation that if it's
2 your planning date, you should have planned for it.

3 CHANG: So I was wondering as a team here, could
4 we come to some kind of a consensus.

5 ROBLES: Let me go through the scenario that we
6 went through. I went through this six years ago at
7 Edwards.

8 What is our ROD date?

9 BURIL: For which operable unit?

10 ROBLES: All of them.

11 BURIL: We have no Operable Unit 1 or 3 ROD
12 dates currently. We don't have any feasible means
13 of dealing with the perchlorate issue. So they are
14 at this point in time indeterminate.

15 The ROD for Operable Unit 2 I think is set
16 right now for mid 2000. So that one may work.
17 However --

18 ROBLES: Mid 2000 add two. And then how long
19 would it take to get a contract for implementation?
20 That usually takes four years, plus long-term
21 monitoring.

22 BURIL: Are you going to implementation?

23 ROBLES: Yes. I'm going to implementation and
24 any other contingencies. 2010 it appears to me
25 would be the earliest, the earliest date. I'm

1 serious.

2 CHANG: So because of the perchlorate issue,
3 that's why I was thinking 2020 would be my best
4 guess.

5 ROBLES: 2010 for Operable 2, but 2000 -- that's
6 the only thing --

7 CHANG: I'm talking about the entire site.

8 ROBLES: Talking about the entire site. 2020.

9 BURIL: That's not entirely unreasonable.

10 CHANG: No, it's not.

11 ROBLES: This is what we always look at. You
12 take your ROD date, you add two years just for any
13 type of contingencies. Then you add four years to
14 that for remediation and implementation. Two more
15 years for contingency. And that's just Operable
16 Unit Number 2.

17 Then you add any X factor for the
18 perchlorate issue and you hit it on the head. So
19 2020 sounds good to me.

20 CHANG: I just didn't want you guys to be
21 surprised if that filters back down on you guys,
22 "Where did you get this date from?"

23 BURIL: That's fair. You won't hear me argue
24 too loud.

25 CHANG: 2020, going once, twice. Sold.

1 I appreciate your inputs on that.

2 And lastly, a simple thing. I'd like to
3 be able to get down here so I can understand what's
4 going on a little better because of the future
5 community issues I've got to be involved with. Can
6 I get a site tour --

7 BURIL: Absolutely. When do you want it?

8 CHANG: -- on March the 12th? Is that doable?

9 ROBLES: March 12?

10 CHANG: March the 12th.

11 BURIL: I did not bring my calendar. I tell you
12 what. Let's set it. I will change my calendar and
13 I will do it.

14 CHANG: Because I've got a meeting down here in
15 Southern California so I was going to try to take
16 advantage of that.

17 ROBLES: March 12 is Thursday, the second
18 Thursday of the month.

19 BURIL: That's right in the middle of process
20 verification.

21 Are you going to be down any time after
22 that? That would be helpful to us because we have a
23 major thing going on from NASA headquarters. We
24 don't want to push you off too far.

25 ROBLES: Could B.G. and Mark --

1 BURIL: They could. I don't mind that too much,
2 but I would prefer --

3 ROBLES: I know you want to be here.

4 BURIL: -- to be involved there because there's
5 a lot of history in terms of JPL perspective and
6 things that will help you understand the community
7 relations issues that you're getting dragged into.

8 CARLOS: I'd like to join that site tour. That
9 will help me familiarize myself.

10 BURIL: That seals it. I'll do it. I'll just
11 make it work.

12 ROBLES: I'll just make sure, since I'm on the
13 team, and I think I know the contract --

14 BURIL: Keep me out of it on the 12th if you
15 can.

16 ROBLES: Got it.

17 BURIL: Let's just do it. We'll make it happen.

18 CHANG: All right. Thanks.

19 ROBLES: Because I think it's real important to
20 keep in mind.

21 BURIL: What time?

22 RANDOLPH: I was hoping you could maybe take a
23 real quick walk this afternoon.

24 BURIL: You're probably running off to your
25 other site.

1 CHANG: I've got other priorities.

2 ROBLES: I would recommend you do it as early as
3 possible starting because you need to walk through
4 the whole site and go through and have the three of
5 them give you the information that you need, because
6 it's going all around. To Valley Water, down to --

7 BURIL: We can give you the grand Cook's tour.
8 There's no doubt about that.

9 CHANG: I'm going to pull you out with me, so
10 how long will it take you to get up here?

11 NIOU: To get here? That's easy. One hour.

12 ROBLES: Shoot for 8:00?

13 BURIL: No.

14 ROBLES: 9:00?

15 CHANG: Trafficwise, I don't think that's
16 realistic.

17 BURIL: That's not realistic.

18 ROBLES: 9:00.

19 BURIL: 9:00 on the 12th?

20 CHANG: Yeah. Let's shoot for 9:00. I think we
21 got here almost that time this morning.

22 NIOU: Or 9:30 because parking, remember.
23 Getting in the door.

24 CHANG: Parking was such a hassle this morning.

25 BURIL: Make it 9:30, then, because by 9:00

1 o'clock things have died a little bit out there.

2 CHANG: It took me longer to try and find a
3 parking place than it took me to get here from
4 Orange County.

5 BURIL: You are not the only one that has that
6 problem. I apologize on behalf of JPL, but there's
7 not a whole lot I can do about it.

8 CARLOS: I guess I was lucky this morning.

9 CHANG: The guard sent me off. He says "Park
10 back there." So I go park back there and the gate
11 won't open. So I come back to the driveway. He
12 says "You can't park there. You wait till I open
13 the gate." Well, the gate won't open.

14 ROBLES: We got to apologize. They just got
15 outsourced.

16 BURIL: Okay. Is that it?

17 NIOU: Yes.

18 BURIL: Anybody else have anything you want to
19 bring up?

20 CARLOS: How long do you think that tour will
21 take?

22 BURIL: I can make that take as long as you
23 like. I've given it in as little as 45 minutes and
24 I've taken as long as about four and a half hours.

25 NIOU: Because they can show you some really

1 interesting things at JPL.

2 ROBLES: You really need to get -- and you need
3 to ask questions all along.

4 BURIL: If I give you the 45-minute whirlwind,
5 you never step out of the van and I just drive you
6 everywhere.

7 ROBLES: But you need to step out and walk.

8 BURIL: If we give you the in-depth, long-term
9 tour, you're going to be hiking up and down the
10 Arroyo.

11 RANDOLPH: In the rain.

12 BURIL: We did that once. Remember that? In
13 fact, Richard, I think you were on that trip.

14 GEBERT: No, I wasn't on that. I went on the
15 45-minute whirlwind tour. I had a conflict that
16 day. But I'd like to go, if possible. But let's
17 not change it on my account.

18 BURIL: Let us know.

19 ROBLES: I think it's very important for you.

20 CHANG: It is.

21 BURIL: I tell you what. I will just clear my
22 calendar for the day. If you come with some thought
23 as to the kinds of detail that you'd like to hear
24 and you can provide that to me that morning, that's
25 fine. I can make this as complex or as simple as

1 anyone likes. Anyone who has been on this tour with
2 me knows that I've done it hundreds of times and I
3 can add or subtract information as necessary.

4 CHANG: All right. Thanks.

5 BURIL: Anything else?

6 GEBERT: Next meeting or next telecon?

7 BURIL: Let me go through the action items from
8 our last meeting, make sure we've covered all of
9 that.

10 I know I didn't go through them first, so
11 I'm struggling to find them.

12 Here we go. Basically, we talked about
13 actions regarding the SVE and additional
14 characterization and following through on getting
15 comments and so forth back to us in a timely
16 fashion, which we have all done.

17 Also, somewhat of an unspoken action item
18 regarding perchlorate, and we discussed that at
19 length and you're aware of how things are coming up.

20 The only action that we took officially
21 from the last one was to have you folks review the
22 information that you were given for the various
23 things and to get comments back to us, which you
24 have done.

25 Our action today, I think, Judy, you can

1 reiterate for us. And basically, that was all we
2 had from the last time. So Judy, if you could
3 reiterate what we had from this week. I know you
4 were taking notes there.

5 NOVELLY: Okay. We're going to get a copy of
6 the SVE pilot test workplan to Peter today. We
7 expect to have a copy to the agencies in about a
8 week.

9 We'll take the radiation question letter
10 to Fred Sanders and get the answers back to James as
11 soon as possible. But James, if you can call me
12 with the number of your people that Fred might want
13 to talk to, I'd appreciate that.

14 CHANG: Okay.

15 NOVELLY: B.G. is going to send a copy of the
16 soil vapor well data directly to Richard.

17 Chuck is going to look into the problem
18 with getting the State paid for the last quarter.

19 And we're going to be setting up a tour
20 for 9:30 on March 12 for James, Alex and Stephen.

21 That's it.

22 CUTLER: Is Stephen going to e-mail us Jon's --

23 NIOU: That's -- when I go back, I'll call Chuck
24 for the e-mail address.

25 BURIL: Do you have a card that has your e-mail

1 address on it? Can you give it to me? I can just
2 send you a message and you'll get it automatically.
3 That might be easier.

4 NIOU: Let me write my --

5 CHANG: Judy, the radiation thing, EPA's point
6 of contact is going to be Perianne Wood. I don't
7 have her number right off, but I'll get that to you.

8 BURIL: I know Perianne. She was the lead
9 auditor that came in on the surprise inspection in
10 '92. Nice lady.

11 NOVELLY: Do you want to check the next meeting?

12 BURIL: James is the only one with a calendar.
13 What have you got there, James?

14 The next required meeting would be in
15 three months, which would place us into May. I have
16 two requests regarding May. One is to avoid the
17 week of the holiday and the second is to avoid the
18 week ending on the 30th and 31st.

19 ROBLES: There's a lot of holidays here.
20 Mother's Day.

21 GEBERT: That's on a Sunday.

22 BURIL: Mother's Day I'm not worried about. My
23 wedding anniversary is in there, too, but I'm not
24 going to worry about that.

25 Does anybody have dates that they can't

1 make? Let's start there.

2 CHANG: The last week. I'm like you. I'm out.

3 I can't do it the last week of May at all.

4 BURIL: Is that the last full week, or just --

5 CHANG: The last full week.

6 ROBLES: May 13th, the second Thursday?

7 CHANG: Second Thursday.

8 GEBERT: Second Thursdays are out for me.

9 NIOU: Thursday is the 14th.

10 CHANG: 14th is a Thursday.

11 ROBLES: I'm looking at the wrong year.

12 CHANG: 13th is actually on a Wednesday. That's

13 fine with me if nobody else has problems.

14 ROBLES: 14th is --

15 BURIL: Richard said he can't make it.

16 GEBERT: I can't make it on the second

17 Thursdays.

18 ROBLES: How about the 12th, a Tuesday?

19 BURIL: I'd prefer to keep it off Tuesday, if we

20 could. Is Wednesday okay?

21 CHANG: That's fine with me.

22 GEBERT: Fine.

23 BURIL: Anyone with triskaidekaphobia in here?

24 ROBLES: The only think is we got to use this

25 room. We can't use the conference rooms on

1 Wednesdays.

2 BURIL: We'll find us a room.

3 ROBLES: So the 13th?

4 CHANG: That's fine with me. The last time we
5 talked about you guys were interested in coming up.
6 You still want to do that? I'll host it.

7 ROBLES: I think we should.

8 BURIL: Set it up. Let's do it. Alex, are you
9 available to go to Frisco?

10 CARLOS: I'm open all the --

11 BURIL: Richard?

12 GEBERT: That's okay.

13 CARLOS: What time?

14 CHANG: Just to be safe, I think we should keep
15 it at 10:00 o'clock. So we don't have any
16 transportation glitches.

17 GEBERT: Have some time to get flights and all
18 that straightened out.

19 BURIL: Is it quicker to go into Frisco or
20 Oakland to get to you?

21 CHANG: You came by both ways. Which do you
22 think is quickest?

23 NIOU: To EPA, actually, San Francisco is faster
24 because you can take the -- there are so many buses,
25 vans and you can go to downtown area.

1 BURIL: I was just wondering whether catching
2 the BART off of Oakland airport might drop us right
3 -- how close is the BART to you guys?

4 CHANG: The problem with catching the BART out
5 of Oakland is that you've got to transfer BART.

6 BURIL: Oh, it is a transfer?

7 CHANG: So you don't want to do that. The
8 easiest thing is fly straight into San Francisco.
9 Take the Super Shuttle and it will drop you right at
10 our office.

11 BURIL: That's fine.

12 ROBLES: Do you think we can make it in day, go
13 in the morning, come back at night?

14 BURIL: We can try.

15 CHANG: I do it with my other Southern
16 California bases. They come up in one day and
17 they're back.

18 BURIL: We've done it lots of other times.

19 CHANG: I guess I can e-mail you some
20 instructions later on.

21 BURIL: If you'd like.

22 CHANG: As the time gets closer.

23 BURIL: Sure. That's fine. I've been to EPA
24 headquarters quite a number of times. Is it 72
25 Howard Street?

1 CHANG: 75 Hawthorne.

2 BURIL: Hawthorne. That's it. I can drive
3 there. I just don't know the street names.

4 ROBLES: Have you got anybody else you want us
5 to meet up there?

6 CHANG: Let's see.

7 ROBLES: Your radiation people?

8 CHANG: If radiation is still an issue, sure,
9 I'll bring those guys in. But if there's somebody
10 you guys would like to meet, let me know. I can
11 certainly arrange that, too.

12 CUTLER: We will be getting the risk assessment.
13 Would there be any issues with Dan Strolka?

14 BURIL: The one thing I would have some interest
15 in hearing a little bit about, maybe you have it
16 now, maybe it might be then, is what progress, if
17 any, has been made regarding an MCL being developed
18 for perchlorate and any kind of a time frame that
19 might be associated with that.

20 ROBLES: And has a process been developed within
21 EPA to look at the next chemical du jour of the
22 month? Because this is not going to be the first
23 time.

24 CHANG: No.

25 ROBLES: And the bottom line is if we have to

1 keep hiccuping the process every time a new chemical
2 comes on line, then 2020 is going to be 3020.

3 CHANG: I know at this point in time there is no
4 EPA guidance on MCL until that toxicity study is
5 done. I'll let you guys know as soon as --

6 BURIL: Appreciate that.

7 ROBLES: James, even more importantly, I'm not
8 stupid enough to think that we're able to resolve
9 this issue so quickly.

10 CHANG: No.

11 ROBLES: But I think that the people that are
12 going to make the decision need to understand from
13 the people out in the trenches that this issue is
14 bigger than just perchlorate and that they need to
15 start considering when they set MCL levels or
16 proposed levels, not to do it haphazardly.

17 CHANG: Sure.

18 ROBLES: This includes the State. This includes
19 the Water Board. I don't know -- the 18, but look
20 at the problem that it's caused us. And if it's
21 dropped, all the waters of California will be off
22 line. We're talking a major impact. So there has
23 to be some talk. And have you seen the paper with
24 the THM?

25 BURIL: Yes.

1 ROBLES: You see that the public is really
2 losing confidence in we, who are supposed to be
3 protecting them, and the experts.

4 CHANG: I'm pretty sure Kevin Mayer, who is the
5 perchlorate guru, he's not going to lead any MCL
6 levels until he gets the stakeholder inputs, you
7 know, on what the level should be after he shares
8 the toxicity study results.

9 CUTLER: Do you know when those results --

10 CHANG: It was supposed to happen sometime this
11 summer. That's the approximate.

12 BURIL: We're looking at probably this time next
13 year before he gets them down.

14 CHANG: Oh, yes.

15 BURIL: Great. Anything anyone else has?

16 I thank you for a short meeting. We'll
17 call it adjourned.

18 (The proceedings adjourned at 12:33 P.M.)

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**ENVIRONMENTAL AFFAIRS OFFICE
MEETING ATTENDANCE RECORD**

**SUPERFUND RPM MEETING
February 18, 1998**

Please print the information requested below and pass this sheet along to the next person. Thank you.

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