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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

PUBLIC MEETING

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In the Matter of :

IRON MOUNTAIN MINES SITE,
REDDING, CALIFORNIA

SITE INVESTIGATION AND STUDY
OF CLEANUP ALTERNATIVES

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THURSDAY, AUGUST 15, 1985

7:30 p.m.

Red Lion Motor Inn

Redding, California

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CLIFFORD M. FISHER, C.S.R.

LICENSE NO. 2727

1 APPEARANCES:

2 For the EPA:

ENVIRONMENTAL PROTECTION AGENCY
Region IX
215 Fremont Street
San Francisco, CA 94105BY: JERRY CLIFFORD
and
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8 OF CALIFORNIA:WATER QUALITY CONTROL BOARD
100 E. Cypress Avenue
Redding, CA 96001

BY: JAMES PEDRI

11 From the Engineering
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RAY PRETTYMAN
and
MIKE SMITH

16 ---o0o---

1: TRANSCRIPT OF PROCEEDINGS

2
3 MR. CLIFFORD: I guess we can get started. Good
4 evening, everybody. Welcome to the public meeting to discuss
5 the Iron Mountain Mines feasibility study.

6 I'm glad all of you could take the time out of your
7 busy schedules to come here tonight and listen to our
8 presentation and hopefully comment on what we've done and what
9 we intend to do.

10 My name is Jerry Clifford. And I'm Chief of the
11 Federal Response Section from the Superfund Branch, with EPA's
12 Region IX office in San Francisco. And I'll be moderating
13 tonight's sesion.

14 With me here tonight are Tom Mix on my far right. He's
15 our Regional Project Manager and is in charge of the Iron
16 Mountain Mine Superfund site.

17 At the door is Tim Vendlinski. He's our Community
18 Relations Coordinator. And many of you maybe have met him
19 already as you came in the door.

20 And to my immediate right is Jim Pedri. Jim is
21 Supervising Engineer with the California State Regional Water
22 Quality Control Board here in Redding.

23 And then on my left is Clifford Fisher. Cliff's our
24 court reporter. He'll be recording our presentation as well
25 as all your comments to make sure that we get everything down

1 correctly, and also to make sure that we can respond
2 appropriately to everybody's comments.

3 And the gentleman on my immediate left is bringing in
4 the podium for our comments.

5 Thank you.

6 What we would like to accomplish tonight is three
7 things: First, we would like to present the results of our
8 investigation into the Iron Mountain Mine Superfund site.
9 And we would also like to present the results of our study to
10 evaluate cleanup alternatives to the site.

11 Second, we would like to be able to offer a chance to
12 the public to answer any questions that you may have and
13 hopefully we'll be able to give a reasonable answer to your
14 questions.

15 And lastly, and most importantly, is I hope a lot of
16 you came here to comment on what we've done and on our
17 reports, because that's the primary emphasis of this meeting.

18 For those of you who don't know, we're in the middle of
19 a formal three-week comment period that began on August 2nd
20 and will end on August 23rd. We hold these public meetings
21 typically in the middle of the public comment period to give
22 you all a chance to look at our reports, then to meet with us
23 midway through the comment period so that we may answer and
24 respond to any questions you have, hopefully clear up any
25 things that need to be cleared up for you, the public, and

1 also give you another week or so to go back, digest what you
2 have read previously, what we've mentioned to you tonight and
3 discussed with tonight, and then to write formal comments to
4 us.

5 So with that, those three main objectives of tonight's
6 meeting, that's how our agenda is set up. I hope all of you
7 got a copy of it. It was handed out at the door when you
8 signed in. For those of of you who didn't get one, you can
9 see Tim and I'm sure he probably has some more copies for you.

10 First on the agenda, I'll give a very brief overview of
11 the Superfund process, how we at EPA find hazardous waste
12 sites, and then the process that we go through to identify the
13 extent of the contamination, and also cleanup alternatives and
14 then the decision-making process through cleanup.

15 And that will be a very short presentation.

16 Following that presentation, Mr. Jim Pedri will give
17 you an overview of the State's involvement at Iron Mountain
18 Mines and also give a brief overview of the problems at Iron
19 Mountain Mines.

20 Following Jim's presentation, Tom Mix, our Regional
21 Project Manager, will give a brief presentation on our
22 findings in our investigation and then discuss our
23 feasibilities study, which is a document that's up for public
24 comment at the moment.

25 Following Tom's presentation we'll take a short break,

1 maybe five minutes, give everyone a chance to stretch their
2 legs out a little bit and then we will come back and have a
3 question and answer session.

4 And then follow that we'll enter our last phase which
5 will be the public comment session.

6 Questions and answers, you all can feel free to just
7 raise your hand, ask questions, sitting in the audience. But
8 for the public comments, I would appreciate it if you would
9 come to the front and state your name for the court reporter
10 and for the record and offer comments from the podium up here.

11 So with that intro, I think I can begin with a quick
12 overview of the Superfund process.

13 EPA established priorities for cleanup. In those
14 priorities for cleanup, we have a model that we use. It's
15 pretty complex, but the idea behind it is that EPA is not able
16 to clean up every hazardous waste problem that's out there.

17 So what we've done is we've used a ranking system that
18 we use to rank sites in terms of priorities so that we're
19 dealing with the most serious problems first.

20 Now, before a site gets to the national priorities
21 list, typically EPA hears from either the regional water
22 quality control boards, another state agency, a local agency.

23 They tell us they have seen some drums, they know of a
24 problem and they let us know about it.

25 Following that, we'll send out a team of investigators.

1: They'll go out and perform what we call a preliminary
2 assessment and a site inspection, site investigation. And
3 that's a very brief look at the problem and just to enable us
4 to then score it and figure out whether it's a serious enough
5 problem to put on a national priorities list.

6 If it is, it gets proposed to the national priorities
7 list and then EPA is able to spend money on it to investigate
8 the site and clean it up.

9 Once it's on the national priorities list, our next
10 step is, either with the responsible party or with our
11 contractors or through the state, we'll develop a work plan
12 for the investigation and feasibility study, which is an
13 evaluation of alternatives for cleanup.

14 And based on that work plan, that allows us to fund
15 what we term the RI and the FS. An RI is Remedial
16 Investigation and the FS is the Feasibility Study.

17 Now, the investigation is just what it sounds like.
18 "Remedial" may or may not mean anything to anybody here. It
19 refers to remedy or cleanup.

20 Investigation is where we go out, define what's out
21 there in the environment, how much is out there and how bad it
22 is. And based on that investigation, which is typically a
23 long-term process, many months, sometimes over a year -- we
24 take soil samples, ground water samples, surface water
25 samples, air samples. We try to get a real good picture of

1. the whole problem.

2 And once we have the problem well defined, we start
3 developing cleanup alternatives, looking at technology to
4 figure out what's out there to address these problems, how can
5 we use them to our advantage at the least cost and solve the
6 environmental problem.

7 So in that, that's what we call or Feasibility Study.

8 And the RI and the FS, the Remedial Investigation and
9 the Feasibility Study, is where we're at right now, again
10 right in the middle of the public comment period.

11 Now, what happens after tonight? Well, we'll listen to
12 everybody's comment. Clifford Fisher here is going to be
13 recording everybody's comments.

14 We'll take everybody's comments into consideration.
15 And then we'll make a recommendation here in the regional
16 office to EPA headquarters in Washington.

17 It's their decision on what cleanup alternative is
18 selected. Hopefully, they listen to what we recommend. Based
19 on that decision, money will get obligated to fund that
20 cleanup alternative.

21 And the decision-making process is called a record of
22 decision. And that's the third-to-the-last box there on the
23 screen. It's a formal process where we recommend a decision,
24 and either the Assistant Administrator, or the Regional
25 Administrator in some circumstances, actually makes that

1: decision and it gets entered into a record.

2 Following that record decision, we're able to fund --
3 obligate money for the design of the cleanup alternative and
4 then ultimatley to clean up the site.

5 And once a site's been cleaned up, then typically there
6 may be or may not be some operation and maintenance that has
7 to follow.

8 So that's a quick overview of our process of Superfund.
9 That's how we deal with all Superfund sites, for the most
10 part. And that's how we've dealt with up to this point the
11 Iron Mountain Mine site.

12 So with that, I would like to turn it over to Jim Pedri
13 with the Regional Water Quality Control Board. He'll be
14 giving you a presentation on the state's involvement and an
15 overview of the problem.

16 Jim.

17 MR. PEDRI: Thanks, Jerry.

18 As Jerry stated, my name is Jim Pedri. I'm Supervising
19 Engineer in charge of the Redding office of the California
20 Regional Water Quality Control Board.

21 For many of you who are not aware of our agency, we're
22 the agency in California responsible for enforcing of the
23 state and federal pollution control laws. And this involves
24 all types of waste discharges, including sewage treatment
25 plans, industrial facilities and, of course, mining

1 operations.

2 Now, we have been involved with Iron Mountain Mine
3 probably for 25 to 30 years. We have been aware of the
4 problem. We've worked fairly closely with the previous owner,
5 Stauffer Chemical, in maintaining the operation of certain
6 treatment facilities at the site.

7 We have also been involved in a more intense sense
8 since 1975 when we actually opened an office here in Redding.

9 In 1975, we began by having a property assessment of
10 all the abandon mines in the Redding area by the US Geological
11 Survey, who actually told us who owns what piece of land so we
12 can start writing permits and talking to the mine owner to
13 solve the pollution problems coming from these mines.

14 Of the several things we have done in the mines to
15 identify problems, and particularly Iron Mountain Mine, is,
16 first of all, to identify sources of pollution at each of the
17 mines.

18 We have actually gone up there and walked the hills up
19 and down in hot weather sun and cold weather snow and looked
20 and identified pollution problems that the mine owners didn't
21 even know, and identified the problems that needed to be
22 corrected and those that did not need to be corrected.

23 Then we went back to the office with this data and,
24 using the exists laws that the state has, wrote what we call
25 waste discharge requirements. And basically, that's a permit

1. that tells the mine owner what pollutants can be discharged
2 from the property, and also what monitoring the mine owner
3 should perform to monitor those pollutants to assure that
4 we're protecting the state's water users.

5 And then, of course, following writing these permits is
6 the enforcement of these permits. And in this case, we have
7 been actively involved with Iron Mountain Mine. I think the
8 record is history now, that there's been enforcement since
9 about 1977.

10 And that has been recently culminated, the enforcement
11 of the operation of the existing facility, in a settlement
12 agreed upon by the mine owner and the courts in which the
13 state received five hundred and thirty-three thousand dollars
14 in fines.

15 Now, I should point out that that money has been
16 earmarked and set aside for continued pollution control work
17 at the mine. It will not be used in other areas of the state.

18 On the issue of enforcement, our job is to determine
19 the impacts on the beneficial uses. This would be impacts on
20 fishery, downstream mining operation, any potential impacts on
21 water supplies and also impacts on the esthetics and of
22 downstream property owners.

23 In association with these impacts, we have also worked
24 closely with the Department of Fish and Game and the Bureau in
25 working out agreements with other agencies, such as the Bureau

1 of Reclamation, in what flows can be released from the debris
2 dam that controls part of the pollutants from Iron Mountain
3 Mines. And we have worked for years in modifying these
4 agreements so that the river is protected to the extent
5 possible from damaging pollutants.

6 And finally, we have had some money allocated by the
7 state at various times to pursue research in identifying ways
8 to attack the pollutants that come from the property that
9 technology really hasn't prepared us with an answer yet.

10 And this has been probably the most frustrating part of
11 our work with the state, because we have had some limited
12 funds that we really haven't attacked the problem with at Iron
13 Mountain.

14 The problem as it exists today is the same as it has
15 been essentially for 50 to a hundred years -- actually about
16 50 to 70 years. It's essentially -- the pollutants in terms
17 of copper, zinc and cadmium are entering the river as they
18 were 20 years ago.

19 And it's only fortunate that EPA two years ago decided
20 to pursue Superfund cleanup of the site, because now the state
21 sees this as a means where we can really clean up the
22 property. The funds are there to actually go in and do a
23 complete cleanup or a cleanup to the degree that's needed to
24 protect the fish.

25 So I think the best way to show the problem is to show

1. in slides that I have prepared. And these slides will
2 essentially do three things: They'll depict the sources of
3 pollution to the property, they'll show some of the control
4 efforts that have been expended to date -- and this includes
5 the upper -- and they will also show the impact of the mine
6 discharges on the downstream waters.

7 If I could have the lights, please.

8 This first picture is an aerial view of the scar that
9 you can see from most places in Redding here. And that's the
10 top of Iron Mountain.

11 This is what we call the Slickrock Creek basin. At the
12 very top of the picture, right here (indicating) is what we
13 call the Brick Flat Pit.

14 Here's another view of the Brick Flat Pit and Slickrock
15 drainage basin. Most of the material you see here that you
16 can see from Redding was overburden that was pushed over the
17 side right about here (indicating) from the pit when they
18 excavated it for extraction of ore.

19 And this operation occurred sometime in the Fifties. A
20 large slide occurred around 1955 that buried a town that was
21 once located down at the bottom of the picture.

22 Here's another view of the pit. And if you look
23 carefully in the very center, there's this residual. And this
24 was during the summertime when flows are low and they can seep
25 into underground works and come out the portal.

1. Basically, there's -- we have categorized the seeps of
2 pollution sources at the mine as two types: One, the surface
3 source, which is other tailings deposits such as these; and
4 over here on Boulder Creek there's a large tailing deposit on
5 Flat Creek called the Minnesota Pile and is essentially the
6 only pollution source on that creek. And exposed ore body in
7 the Brick Flat Pit area.

8 And then there's what we call underground pollution
9 sources which include the portals such as the Richmond Portal,
10 Lawson Portal and a seep that's part of ol' mine, or No. 8
11 Mine Portal on Slickrock Creek.

12 This is a picture of the surface ore deposits in the
13 Brick Flat Pit. If you look carefully at the middle of the
14 picture, that's some runout that's occurring after rain. And
15 acid rain on the pyritic ore here, and heavy metals associated
16 with that process, can be discharged in the surface waters
17 into Slickrock Creek, and then into Spring Creek and the
18 Sacramento River.

19 These are the tailings deposit that's the residual from
20 past mining operation on the banks of Boulder Creek. You can
21 see there's a lot of gullying associated with that. A lot of
22 this material has been washed into the streams.

23 And there's also seeps from this type of material,
24 which occur during heavy rains. And these seeps can contain
25 substantial amounts of dissolved copper, zinc and cadmium.

1 And these are the three elements that the state has identified
2 as being most toxic to the fish and aquatic life downstream.

3 Here's another picture of the drainage coming off the
4 tailings deposits. And the red color is characteristic of the
5 acid drainage in the area. And it's caused by the dissolved
6 iron that's in the water.

7 There are also large quantities, of course, of copper
8 and zinc.

9 This is a picture of Boulder Creek under higher
10 conditions. The greater color of the creek is caused by the
11 erosion of the pyritic tailings into the creek. These
12 tailings become deposits that accumulate downstream, are later
13 redissolved and enter the system as dissolved metals.

14 This is the Minnesota Pile as it exists today. And
15 this is located on the Flat Creek drainage. Again, this is
16 the only pollution source on that drainage. And at times when
17 water sits in the -- on the material as it is here, it has
18 time to form the acid and dissolve the metals in the ore
19 tailings themselves.

20 And these -- this water is later discharged during
21 periods of higher flow out either the outlet that you see here
22 (indicating) or, at higher, extremely high flows, out the pipe
23 you see here. And at times this will pollute Flat Creek to
24 where there's no aquatic life in the creek.

25 Then we have unidentified seeps that occur throughout

1 the property. Here is a picture of a seep on Slickrock Creek.
2 Again the color is characteristic of the dissolved metals.

3 Another picture of a seep to Slickrock Creek.

4 And this is something that we discovered about 1977,
5 which we thought was simply a seep, but it turned out to be a
6 buried portal at this point. And the concentration of copper
7 was high enough at this point that it could be removed by what
8 we call a simple cementation process.

9 And the cementation process is basically where you use
10 shredded metals in bins, pass the water through the shredded
11 steel, and the copper is exchanged with the iron. And the
12 copper is reduced upwards of 95 percent.

13 Here on the -- the Iron Mountain Mine owners built this
14 diversion and used the stainless steel pipe to trap this
15 drainage water and transport it to a cementation plant that
16 they construct the with their funds.

17 Now, the major sources of pollution to the property, as
18 the property states, are the portals that lead from the
19 underground workings. And this is a picture of the worst
20 source of pollution on the property, the Richmond Portal.

21 About 70 percent of the zinc and cadmium that is
22 discharged from the property occurs at this point, and
23 approximately 30 percent to 40 percent of the copper.

24 For the past 20 to 30 years or so, this flow has been
25 captured in the mine itself in dams, transported several miles

1 in a stainless steel flume, down to a treatment plant.

2 This picture is in here to show that there is a direct
3 relationship between the pit at the top of the hill and the
4 Richmond Portal. The ore body from the Richmond Portal is
5 directly below the pool of water. And when it rains for
6 extended periods of time, the level in the pit fills, the
7 water flows down to the mine workings and then comes out the
8 portal at flows that are beyond what the flume system can
9 handle.

10 And here's a picture showing an overflow of acid mine
11 drainage during a high rainfall period. I think this was
12 1978.

13 The high flow from the portal also causes -- caused a
14 problem about 1978, I believe, also, in which the dam in the
15 portal that collects this flow to take it to the treatment
16 plant was inundated and washed away.

17 And the state's involvement at this point involved
18 bringing people from a conservation camp or honor camp up to
19 the site, filling sandbags with sand and going back into the
20 mine and building a temporary dam until the mine owners could
21 build a permanent structure to see that the mine drained and
22 is not bypassed, but treated.

23 We have a couple picture of the crews hard at at work.

24 Okay. The culmination of the flume system on Boulder
25 Creek is the Slick -- is the Boulder Creek cementation plant.

1 And here's a picture of the upstream side of the plant.

2 Here's an overview of the plant. If you look carefully
3 in about the center, there's a bin that's filled with the
4 shredded steel. And when filled, one or more bins are filled
5 such as this, the removal efficiencies for copper approaches a
6 hundred percent and is usually -- always above 95 percent.

7 There's a load of the scrap metal being dumped into the
8 bin awaiting placement in the tanks for copper removal.

9 And here's a picture of the metal as it sits in the
10 bins when they're fully charged. While this is occurring, our
11 orders, the requirements that we placed on the mine owner,
12 will be complied with virtually in every case.

13 In the past eight to ten years, however, other types of
14 metal have been used. In this case, whole aluminum cans,
15 baling wire, which does not have the density required for
16 proper treatment in removal of the copper, or in many cases no
17 metal at all. When this happens, of course, we get virtually
18 no treatment of copper.

19 This is the situation that led to the violation of our
20 requirements and the subsequent court battles and legal
21 actions that have been taken against the current mine owner.

22 I might point out that as of today, the facilities, as
23 of our last inspection, are being operated in an efficient
24 manner. There is metal charged in the bins and there is
25 sufficient copper removal taking place at the site.

1 The copper removal plans do produce a by-product that
2 helps offset the cost of operation. Hear you see a pile of
3 what we call copper sludge or cement sludge, cement copper.
4 This contains approximately 50 to 60 percent copper. It can
5 be shipped and sold to be later refined into copper products.

6 Now, this chart shows an incomplete listing of the
7 enforcement actions taken against Iron Mountain Mines. Two
8 things should be added to this list. And rather than taking
9 the time to go through it, you can see that the sequence
10 proceeded from our requirements which I mentioned, again
11 requirements in the form of an NPDES permit, a cease and
12 desist order, and then it was referred to the Attorney
13 General, all according to state law.

14 And then we entered into a preliminary injunction,
15 contempt of court proceedings, other orders, and then finally
16 a stipulated order with the appeals court in Sacramento. And
17 this order stated that the mine owner agreed to pay \$500,000
18 in fines, reduced to 400,000 if payments were made over a
19 protracted period of time.

20 We did receive about \$75,000 in this payment and for
21 various reasons we received no further payments.

22 The agreement became in default and we scheduled to
23 hold a Sheriff's sale of the property. I think many of you
24 who are local are probably aware of that. It was published in
25 the paper.

1 That sale almost came to fruition, but about a week
2 before that an agreement was reached with the mine owner and
3 various attorneys in which the state did receive full payment
4 of all the back fines owed the state. And that's the money I
5 referred to earlier.

6 The last set of slides here shows the impact of the
7 discharge of pollutants from the mine property on the
8 reveiving waters and the downstream waters.

9 This is a picture of Boulder Creek above the mining
10 activity. It has an acidity content close to neutral. Fish
11 could survive there.

12 This is a picture of the Boulder Creek downstream.
13 Again, the pollutants have caused this creek to be virtually
14 devoid of any aquatic life. There are no fish residing in
15 this creek. This occurs for the remainder of Boulder Creek
16 and also causes pollution of Spring Creek down to its
17 confluence with Keswick reservoir.

18 This is a picture of Spring Creek itself. This again
19 is upstream of any of the pollution sources on Iron Mountain
20 Mine property. The pH in this zone is close again to neutral.
21 The metal concentrations are slightly elevated due to a small
22 mine upstream. However, there are fish living upstream in
23 Spring Creek above the Stole mine.

24 Below the mine, as you see in this picture, is where
25 it's documented that there is no fish living in here, but the

1 stream is quite clear.

2 This is again a picture of Spring Creek below the
3 sources of pollution from Iron Mountain Mine.

4 This is a picture showing the confluence of Boulder
5 Creek, which is the first creek that drains any significant
6 portion of mine drainage from the property into Spring Creek.

7 This is Boulder Creek that comes in on the left of the
8 screen.

9 This is Spring Creek that runs this way (indicating).
10 You can see the flow in Spring Creek is larger than the flow
11 in Boulder Creek. However, its impact causes Spring Creek,
12 which is basically clear above, to turn into the
13 characteristic blood red color, caused by the dissolved metals
14 in the water.

15 This is a picture of Slickrock Creek which also drains
16 into Spring Creek below Boulder Creek, again carrying a heavy
17 pollutant load from the abandoned mine areas.

18 This is a picture of Spring Creek just as it enters the
19 Spring Creek debris dam.

20 And this is a picture of Spring Creek just prior to
21 entering Keswick Reservoir.

22 Spring Creek debris dam was constructed by the Bureau
23 of Reclamation in an effort to control debris that would clog
24 the tailrace of the power plant that receives water from
25 Whiskeytown Lake.

1 A secondary feature of the debris dam was its intent to
2 control pollutants from Iron Mountain Mine that are discharged
3 into the Sacramento River at Shas -- excuse me, at Keswick
4 Lake, which is right in this location (indicating). The
5 debris dam was built in 1962 with the intent of doing both
6 these functions. However, the size of the debris dam is much
7 too small to control the pollutants at all times.

8 During periods of heavy flow, the debris dam fills and
9 then overtops the spillway. And it's these occurrences that
10 have caused most of the major fish kills in the Sacramento
11 River that have been documented in the last 20 years.

12 In this case, in 1978, there was an uncontrolled
13 release here of 1800 to 2,000 cubic feet per second. And even
14 though the water is highly diluted by rainfall, the pH or
15 acidity of this water is about 3.0. So that's several orders
16 of magnitude more acidic than natural water or water that
17 trout or salmon can live in.

18 This shows the confluence of the discharge from the
19 Spring Creek debris dam with Keswick Reservoir. The
20 precipitates you see form here are essentially metals that are
21 dropping out of dissolved solution and into suspension caused
22 by the abrupt rising of the acidity or pH of the water.

23 Here's another picture showing the debris dam, the top
24 portion that discharges into Keswick Reservoir and then
25 release of that water down to the Sacramento River.

1 I might point out that as recently as about five years
2 ago, this section in here (indicating), and then downstream,
3 was heavily used by trout fishermen and was considered one of
4 the best trophy trout streams in the state. I believe rainbow
5 trout of up to 19 pounds were caught in this arm of Keswick
6 Reservoir.

7 Today, there's no fishing activity, due in part to the
8 pollutants in the mine, but also in part to the method of
9 operation of the Bureau of the Spring Creek power plant.

10 Here's another picture of the discharge of precipitates
11 entering the Sacramento River system. In addition to the
12 visible pollutants you see here, there are also dissolved
13 pollutants that are carried down throughout the system and do
14 not settle out in Keswick Reservoir.

15 A picture of the same.

16 Another picture. And here is a good shot that shows
17 the last half mile or so of Keswick Reservoir. You can still
18 see the discoloration. And so the metals are continuing to be
19 discharged all the way down to Keswick remembering Reservoir
20 right here and, of course, into the Sacramento River. And
21 this lighter color you see in here is still the precipitates
22 that are flowing downstream.

23 And finally, I think I have alluded to the fact that
24 there's -- some of the pollution problems or intensity of the
25 the pollution problems are caused by the flow management

1 system that's now a part of the Sacramento River system. This
2 is a picture, of course, of Shasta Dam.

3 And releases from Shasta Dam are very critical in
4 maintaining concentrations of heavy metals downstream from
5 Spring Creek. Although the mine is the source, the Bureau of
6 Reclamation, in constructing the dam, has stopped the source
7 of pollution water that comes during heavy rain. And if they
8 store water behind Shasta Dam and don't release it -- such as
9 water commitments in a dry year, they may want to save water
10 and not be able to afford to release it -- then we have
11 concentrations in the river at Redding that could kill fish or
12 even threaten to harm the water supply.

13 Another factor that could cause an extreme pollution
14 problem is in the winter when we have downstream flooding in
15 the Sacramento River, such as flooding in Red Bluff. Then the
16 Bureau is obligated to hold back releases from Shasta Lake.
17 And of course, we would have -- this would correspond to very
18 high releases at Spring Creek and we would have concentrations
19 that would kill fish.

20 Of course, the priority is to protect homes and life
21 above aquatic life. And therefore we are always faced with
22 the continual possibility of killing fish in the river.

23 And this is a chart that gives an approximation of
24 concentrations of the three heavy metals that affect the
25 aquatic life in the system. And up here we have Spring

1 Creek -- levels of heavy metals in Spring Creek above the
2 major sources of pollution from Iron Mountain Mine. And you
3 can see that the levels are somewhat low. And of course,
4 Spring Creek down below, the levels are ten to hundreds of
5 times higher.

6 And these levels are all in parts per million, or
7 milligrams per liter.

8 The levels in Keswick Reservoir, the Spring Creek arm
9 of Keswick, are indicated here. And then Keswick Reservoir
10 upstream are right below Shasta Lake. These levels are
11 indicated as such (indicating). And finally, these
12 (indicating) are the levels that represent average
13 concentrations in the river.

14 Again, you can see the elevation of the level from
15 actually four thousandths part per million of copper and zinc
16 to three hundredths and 11 hundredths parts per million copper
17 and zinc.

18 And in addition to acute toxicity that's caused by the
19 discharges, another problem has been discovered in the last
20 several years, and that is that the fish that live in Keswick
21 Lake and the Sacramento River -- and these fish are basically
22 collected above the point of discharge -- contain levels of
23 metals in their tissue that are higher than anything else we
24 have found in California.

25 And this (indicating) is the California background

1 levels of metals. You can see the level of copper in the
2 liver of trout is about three times higher in the Sacramento
3 River below Keswick than the California background.

4 And then cadmium is approximately ten times higher than
5 fish found in other places. And these levels have been
6 determined by Fish and Game to be high enough to cause
7 physiological effects and possible reproduction problems in
8 the fish that live in the river.

9 A third problem that is associated with the discharge
10 from the mine is the threat to the City of Redding's water
11 supply, of course. And to date, we have only one or two
12 instances where the levels of cadmium, which is the metal most
13 likely to harm the water supply in Redding, have been at the
14 maximum level acceptable at Keswick Reservoir. We have never
15 measured levels of cadmium at the domestic water intake for
16 the city at that level.

17 But because of the variability of flow releases at
18 Shasta Lake, Keswick, these levels could be exceeded during
19 the winter period. So there is also a threat to the city's
20 water supply.

21 And basically, that concludes the slide portion of my
22 presentation.

23 And to summarize, our activity up till now has been one
24 of working with the discharger or enforcing state laws to try
25 to bring about a solution to the problem. We have been

1 hampered by the lack of state funds to solve the problem and
2 are hopeful that the Superfund program that we're discussing
3 here today will be the answer to solve the problems of Iron
4 Mountain Mine, to assuring that the fish in the Sacramento
5 River are protected at all times, assuring that the drinking
6 supply for the City of Redding is protected at all times.

7 The program is not because of cost constraints in the
8 millions of dollars that it would take to actually bring back
9 Spring Creek into an active, productive stream for trout, it's
10 not a goal to really bring these streams -- to try to
11 rehabilitate Spring Creek for Keswick Reservoir. There are
12 too many sources spread out through the abandoned mine that
13 could cause pollution to exceed safe levels for fish.

14 But we're hoping we can protect Keswick Reservoir a
15 good portion of time and, of course, protect the Sacramento
16 River all times.

17 Thank you.

18 MR. CLIFFORD: Thank you, Jim, for that real good
19 overview of the site problem.

20 Now that everybody understand a little better about the
21 problem and the history that has been associated with Iron
22 Mountain Mines, I would like to turn the program over to Tom
23 Mix, our Regional Program Manager.

24 And Tom's going to discuss item 3 on our agenda, the
25 summary of the Remedial Investigation and our Feasibility

1. Study.

2 Tom.

3 MR. MIX: Thank you, Jerry.

4 Good evening, ladies and gentlemen. My name is Tom Mix
5 and I'm EPA's Project Manager for the Remedial Investigation
6 and Feasibility Study.

7 I appreciate the opportunity to be here this evening to
8 discuss the findings of our Feasibility Study. And I
9 personally would like to welcome you to this evening's
10 meeting.

11 Before I discuss the findings of our Feasibility Study,
12 I would like to provide you with a brief overview of our
13 involvement at Iron Mountain Mine and to give you an equally
14 brief overview of our Remedial Investigation, especially since
15 Jim did a very good job of summarizing it.

16 As Jerry had indicated, the Superfund process begins
17 once a site appears on EPA's national priorities list. In the
18 case of Iron Mountain Mine, the State of California in
19 mid-1982 submitted the Iron Mountain Mine site to EPA as a
20 candidate for the national priorities list.

21 On December 30th, 1982, EPA, in the Federal Register,
22 proposed that Iron Mountain Mine be added to the national
23 priorities list.

24 Later, on September 8th, 1983, through final rule
25 making, Iron Mountain Mine was among 400 other sites

1 nationwide included on the final list.

2 Later in September 1983, EPA commenced the Remedial
3 Investigation and Feasibility Study. As Jerry indicated, the
4 purpose of the Remedial Investigation is to determine the
5 cause and extent of an environmental problem.

6 Typically, this is accomplished by identifying all
7 sources of pollution and determining their relative
8 contribution to the overall problem. To assist in making that
9 identification, environmental samples are collected.

10 At Iron Mountain Mine, we collected and analyzed almost
11 600 surface and ground water samples. And in April 1985, we
12 released a report that summarized our rem -- the findings of
13 our Remedial Investigation.

14 We found that precipitation found at Iron Mountain
15 Mine, both the time of the event when it hit, the quantity of
16 rainfall falling, together with inflow into the Spring Creek
17 debris dam and releases from Shasta Dam, were key factors that
18 determine whether or not discharges from Iron Mountain Mine
19 would present any potential environmental impacts or health
20 impacts.

21 The problem at Iron Mountain Mine really begins with
22 rainfall. When it falls on the mountain, it's going to do one
23 of two things:

24 It will either move off the side as surface water
25 runoff going over and through waste rock and tailings piles or

1' move vertically down into the mountain, either through cracks
2 or cave ground areas and move more rapidly into ore body areas
3 or move into the mountain more slowly as in infiltration.

4 What happens also is that ground water is drawn to the
5 mountain. In fact, that's because there's a series of
6 underground mine workings that act as collector drains and
7 transport mechanisms to take ground water through the mountain
8 itself.

9 As the ground water moves through, it combines with
10 rain water infiltrating or inflowing into the mountain. It
11 mixes with air, which comes in through mine openings, and the
12 oxidizing of the pyritic ore to provide a biochemical
13 reaction. This biochemical reaction then creates sulfuric
14 acid and dissolved metals.

15 It comes passing through the mine and it will discharge
16 the site either as ground water seepage or exit through one of
17 the mine entrances, which is what we call portals.

18 In our investigation, we identified five major sources
19 of pollution which can be grouped into three categories which
20 I have identified as portals or mine entrances, ground water
21 seepage and surface runoff.

22 In the case of the portals, our two major sources are
23 the Richmond Portal and the Lawson Portal. A good example of
24 ground water seepage would be Big Seep, which are at the head
25 waters of Slickrock Creek and the Ol' No. 8. Our last source

1 is the Brickflat Pit bypass.

2 These five sources together account for approximately
3 '72 percent of the copper and 86 percent of the zinc and
4 cadmium that leave the site.

5 As Jim has indicated, past and continuing releases of
6 acid mine drainage from the Iron Mountain Mine site have had
7 environmental impacts and potential public health impacts. I
8 think Jim did an outstanding job of summarizing what the
9 environmental impacts are.

10 And what I just might note is that we found Boulder
11 Creek, Slickrock Creek, portions of Spring Creek and Flat
12 Creek, which isn't pictured on this overhead, are essentially
13 devoid of aquatic life.

14 As the acid mine drainage moves down into the
15 Sacramento River, lethal concentrations of heavy metals has
16 resulted in fish kills. In fact, we have been able to
17 document 30 adult fish kills over the past 40 years.

18 Sublethal concentrations of these heavy metals has also
19 been found to act to depress the overall productivity of life
20 in the Sacramento River.

21 Additionally, there are some potential health impacts
22 associated with coming in contact with the acid mine drainage.
23 Direct skin contact will cause irritation or burns. Having it
24 splashed in your eyes will cause serious eye injury.

25 Although the potential is considered small, ingesting

1 or drinking the acid mine drainage does present a potential
2 public health impact.

3 And, as Jim alluded to earlier, exceeding the drinking
4 standards at the City of Redding water intake could present a
5 public health impact. But let me note, as Jim did, that
6 there's no instance where we have recorded levels of heavy
7 metal above the drinking water standard.

8 Several measures having taken to correct the
9 environmental problem. I think Jim also touched on those, but
10 I'll highlight them nevertheless.

11 There's a copper cementation plant on Slickrock Creek,
12 and also one over on Boulder Creek, which removed copper from
13 the acid mine drainage. This treatment process, however, does
14 not remove zinc and cadmium; so they're freely discharged to
15 receiving waters.

16 The U.S. Bureau of Reclamation operates the Spring
17 Creek debris dam, Keswick Dam and the Shasta Dam complex. And
18 to the extent that they can, they always try to maintain
19 sufficient dilution water from Shasta to mix with releases
20 from Iron Mountain Mines so that the levels of heavy metal are
21 low enough so that there's no toxicity to fish. Generally,
22 this works very good.

23 The problem arises during the winter months when Spring
24 Creek debris dam is at its capacity and it's overflowing. And
25 either due to downstream flooding or due to water

1 conservation, discharges from Shasta Dam are held back.

2 So as the discharges from Iron Mountain Mine get into
3 the Keswick Dam area, they do not have the dilution water that
4 they normally would be getting from discharges from the Shasta
5 Dam area.

6 To address this problem, EPA and the state identified
7 three potential cleanup objectives for Iron Mountain Mine.
8 The first being EPA national water quality standards intended
9 to protect aquatic life.

10 Secondly, the recently adopted state basin plan
11 objectives specific for the Iron Mountain Mine area, which are
12 intended to protect all life stages of fish.

13 Lastly, clean up the background levels. Background
14 would be established by water quality upstream of where Spring
15 Creek enters the Sacramento River.

16 During our cost estimates, we had noted that it would
17 cost approximately two hundred and fifty million dollars to
18 meet background. Due to the exorbitant cost, we removed that
19 objective from further consideration.

20 At this particular time, I'd like to give you a brief
21 overview of our Feasibility Study process. The purpose of the
22 Feasibility Study, as Jerry indicated earlier, is to identify
23 and to evaluate alternatives to clean up a Superfund site.

24 At Iron Mountain Mine this process began shortly after
25 we completed the Remedial Investigation. After we have

1 identified the sources of pollution and determined their
2 relative contribution to the overall problem, this then allows
3 us to identify target areas for remedial response.

4 In the case of Iron Mountain Mine, we targeted two
5 areas, the first being the ore bodies in underground mine
6 workings and, secondly, the surface waters.

7 With regards to the first, what we would seek to do is
8 mitigate and minimize the release of any contaminants or
9 hazardous substances from the site, to limit them from going
10 into the receiving waters.

11 Under the surface water, what we would attempt to do is
12 minimize the fu -- the further migration of the contaminants
13 that have already reached the surface water.

14 The first phase in our process, then, would be to
15 identify technologies that are likely to be successful at Iron
16 Mountain Mine, an alternative such as capping. I said capping
17 because I like -- I'll use that as an example when I get down
18 to the alternatives.

19 These technologies are screened according to technical,
20 public health, environmental and cost criteria. It's a
21 qualitative assessment that's designed to evaluate very
22 quickly a large range of alternatives and narrow them down
23 into a more easily working group.

24 From the technologies that survive this screening
25 process, we develop alternatives. And we identify -- we

1 evaluate them according to the very same criteria that we use
2 for technologies.

3 Now, an example of an alternative -- and I used capping
4 as one of our technologies. For alternatives that we might
5 develop out of that would be capping the ore body with
6 asphalt, capping it with cement, using chemical sealants or
7 stabilizers to keep the material from moving off-site.

8 The alternatives that survive this screening process
9 then are subjected to a more intense and detailed evaluation
10 that takes into account technical, public health,
11 environmental, institutional and cost criteria.

12 What we're really interested in here is evaluating
13 these alternatives to be sure they perform well, that they
14 have a good useful life, that they adequately protect the
15 public health and the environment.

16 We'll also want to note under our institutional
17 analysis whether they're capable of meeting all federal, state
18 and local standards.

19 It would be at this particular phase that we would
20 develop full costs for this alternative, both in terms of
21 capital and operation and maintenance costs.

22 Now, for Iron Mountain Mine we were unable to identify
23 one cost-effective alternative that would address EPA or state
24 standards. Therefore, what we did was to start combining
25 alternatives. This provided EPA with a large range of

1. alternatives from which to select a cleanup program.

2 The effectiveness of each of these alternatives in
3 meeting EPA or state cleanup objectives was predicted using a
4 water quality model which also took into account the ability
5 to meet those standards under four case years, ranging from a
6 normal rainfall year when there was a predictable amount of
7 discharge coming from Shasta and normal inflow into the Spring
8 Creek debris dam to the worse case condition which we
9 identified as 1978.

10 And we also evaluated two mid ranges of alternatives.

11 The whole analysis of these technologies and
12 alternatives and combined alternatives, of course, has been
13 included in the Feasibility Study which is the subject of this
14 three-week public review period.

15 As Jerry has indicated, at the close of our public
16 comment period, which is August 23rd, EPA will prepare a
17 response and summary that will address all the questions and
18 concerns raised by the public.

19 EPA will take those into account and make a
20 recommendation -- each region will make a recommendation to
21 its headquarters office that an alternative should be funded
22 for Iron Mountain Mine.

23 We will then, upon headquarter's selection of a remedy,
24 proceed to the remedial design and remedial action phase.

25 What I would like to do is to give you just a brief

1 overview of the alternatives that survived this detailed
2 screening process that were eventually combined into seven
3 alternatives. Once I walk you through then, this, then I
4 would like to walk you through the combined alternatives
5 themselves.

6 Our first alternative is capping above the Richmond ore
7 body. There's approximately 15 acres of cracked and caved-in
8 ground areas. And what we would do is to grade it and bench
9 it, similar to what I'm showing here, cap it with a soil
10 cement mixture and provide drainage ditches to that clean
11 surface water and discharge it away from the ore body.

12 Our second alternatives involves the interception of
13 clean ground water and diverting it to Boulder Creek. This
14 would be accomplished by rehabilitating the existing Richmond
15 tunnel, creating two more tunnels and wrapping it around the
16 Richmond ore body.

17 There would be vertical drill holes that would
18 intercept ground water as it passes through, draw the ground
19 water down into the tunnels and discharge directly to Boulder
20 Creek.

21 MR. CLIFFORD: Tom, just one second.

22 That top picture up there is an aerial view looking
23 down on the top of the mountain. I don't know if that was
24 made clear. That will give you an idea.

25 And then this is the side view.

1. MR. MIX: Actually, there is one other point I
2 would like to make. There is ground water moving in here
3 (indicating) and moving on top as well, which is why the
4 tunnel is spaced the way that it is.

5 Our next alternative is lime neutralization of the acid
6 mine drainage. We have three alternatives.

7 The first alternative would be to collect the
8 discharges from our five main ore sources, convey the effluent
9 to a treatment plant where lime and limestone would be used to
10 elevate the pH of the water. The heavy metals would settle
11 out in a solid, be transported to an appropriate land fill.

12 Treated water would then be discharged to the
13 Sacramento River.

14 Our second subalternative would treat the five major
15 sources, plus the non-point sources on Slickrock Creek. This
16 would be accomplished by connecting the discharges from the
17 Richmond Portal and Lawson Portal and conveying them directly
18 to the treatment plant.

19 On Slickrock Creek, we would have two diversion dams
20 built. One would be at the head waters of Slickrock Creek.
21 And what we would want to do is divert the clean water around
22 the contaminated areas and discharge it directly into Spring
23 Creek.

24 We would have a second diversion dam here (indicating),
25 which would collect all non-point sources plus the two

1 discharges from the Ol' No. 8 mine, Big Seep and the Brickflat
2 Pit bypass.

3 And lastly, the third subalternative would be to treat
4 all five major sources, plus all non-point sources in the
5 Slickrock basin, together with the non-point source in the
6 Boulder Creek basin.

7 This would be accomplished by constructing diversion
8 dams on the upper Slickrock Creek and Boulder Creek and
9 diverting clean ground water around the contaminated areas and
10 discharging them directly into Spring Creek.

11 On both creeks near Spring Creek, we'll have other
12 diversion dams built. And they will go ahead and collect --
13 will be collecting the non-point sources plus all the five
14 major point sources, bring them over to the treatment plant
15 again for lime treatment neutralization.

16 Our last alternatives are ones that we refer to as
17 water management alternatives, the first being adding more
18 capacity to the Spring Creek debris dam. Currently, its
19 capacity is 5800 acre feet.

20 And what we would be doing would be enlarging it
21 anywhere from 7,000 acre feet up to 23,000 acre feet,
22 depending upon the alternative that we were talking about and
23 the design year for cleanup.

24 Our second alternatives are called transbasin surface
25 water diversions, which quite simply are diverting the clean

1. waters from upper Spring Creek and diverting them over to Flat
2. Creek, taking clean flows from South Fork of Spring Creek and
3. diverting them over to Slickrock Creek.

4. This would be accomplished by constructing low
5. diversion dams in the upper Spring Creek and South Fork Spring
6. Creek.

7. In upper Spring Creek we would be diverted
8. approximately -- or up to 800 cubic feet per second of clean
9. water to Flat Creek. We would have to tunnel through a ridge
10. here (indicating) to take the water from one basin and deliver
11. it to another.

12. And over here on the South Fork of Spring Creek
13. (indicating), we would be diverting up to two hundred and
14. fifty cubic feet per second of clean South Fork Spring Creek
15. water.

16. At this time I would like to walk you very quickly
17. through the combined alternatives. We have seven, as I
18. mentioned. Perhaps the best way to talk about this would be
19. just to go right down the line here.

20. The capping alternative does involve capping 15 acres
21. of cracked and ground areas over Richmond, or using cement.
22. Alternative CA-1, 2, 4 and 7 would utilize that.

23. Intercept clean ground water and diverting to Boulder
24. Creek would be used for Alternatives 1, 2, 4 and 7.

25. The third alternative, lime neutralization, would be

1. used on Alternatives 2 and 3.

2 On Alternatives 2 and 3, what that involves is treating
3 the five point sources plus all non-point sources on the
4 Slickrock basin.

5 Alternative 4 would treat all non-point sources on
6 Slickrock basin, Boulder Creek basin, as well as the five
7 point sources.

8 On Alternatives 1, 6 and 7, we would upgrade the
9 existing copper cementation plants that Jim mentioned in his
10 presentation. And we would continue to operate them.

11 On our enlarge dam alternative, for Alternative CA-5,
12 we would be enlarging Spring Creek to 17,000 acre feet to meet
13 EPA standards, 23,000 acre feet to meet state standards.

14 Alternative CA-6 would include enlarging Spring Creek
15 debris dam to 13,000 cubic feet to meet EPA standards and
16 again 23,000 cubic feet to meet state standards.

17 Alternative CA-7 would enlarge Spring Creek debris dam
18 to 10,000 for EPA, 18,000 to meet state standards.

19 As you can see, there's a wide range of costs here.
20 They really depend on the level of lime treatment and how
21 large the Spring Creek debris dam enlargement will be.

22 At this time EPA believes that the cost-effective
23 solution for the Iron Mountain Mine problem -- in other words,
24 the lowest cost alternative that effectively minimizes threats
25 to and adequately protects the public health and the

1 environment -- is Alternative CA-7, designed for 1978, the
2 worse case condition, and to meet EPA standards.

3 What we're talking about is \$42.8 million.

4 At I would like to briefly discuss a proposed EPA/U.S.
5 Bureau of Reclamation interagency agreement.

6 Under the terms of the arrangement, EPA will agree to
7 fund and construct the capping, the ground water interception
8 and the upgrading of the copper cementation plants.

9 For its part, the U.S. Bureau of Reclamation will agree
10 to fund the design and construction of our water management
11 alternatives, the enlargement of Spring Creek diversion dam up
12 to 18,000 acre feet and to do the two surface water diversions
13 that I mentioned previously.

14 And with that, I would like to thank you very much.

15 FROM THE FLOOR: What's the --

16 MR. CLIFFORD: We'll have a chance to take
17 questions in a few minutes, if that's okay. So if you can
18 just please hold your questions.

19 Are you ready, Tom?

20 MR. MIX: That's it.

21 MR. CLIFFORD: Thank you very much.

22 Tim, could we have the lights?

23 There is one other alternative that we didn't carry
24 through in the Feasibility Study that probably now is an
25 appropriate time to bring it up. And this is an alternative

1 that's been developed by the current property owner, Iron
2 Mountain Mines, Incorporated.

3 For those of you who have had a chance to read through
4 the Feasibility Study, this alternative has been appended to
5 the Feasibility Study. And there are a number of reasons why
6 one, it's been included, and two, it hasn't been carried
7 through this analysis, but has been included as an appendix.

8 First, late in the process of our developing the
9 Feasibility Study we were approached by the current property
10 owner to consider this alternative.

11 Up until this point in time, although we were aware of
12 a possibility of this alternative being developed, not much
13 information had been presented to EPA. But late in the
14 process more information was submitted to EPA.

15 And essentially what the alternative is is to continue
16 to mine the site. And by mining -- continuing to mine the
17 site, it would control -- theoretically, it would control most
18 of the contamination emanating from the site.

19 The idea would be that the water and the discharges
20 coming from the site now would be recirculated back into the
21 mining -- into the ore body to increase the flow through the
22 ore body, concentrate the metals in the liquid.

23 And then once the liquid was concentrated to a certain
24 extent, that water would be tapped -- the discharge would be
25 tapped, the mines would be -- I mean the metals would be

1 dropped out of the solution and recovered in a number of
2 different processes.

3 So that's essentially the proposal. Because it came to
4 us late in the process, it is still in what we could consider
5 a conceptual design stage. It hasn't been carried to the
6 extent of evaluation that our alternatives have been carried
7 to. And that's one of the reasons it's in the appendix and
8 not discussed up front.

9 Probably the most important reason that it's in the
10 appendix and not evaluated to the full extent that these other
11 alternatives were evaluated is that this proposal only becomes
12 a viable alternative if it makes money.

13 Now, EPA, as a governmental agency, is not in the
14 business of cleaning up sites and attempting to market a
15 product and become a private business. That's not something
16 the agency would do. And for that reason, that's not --
17 that's why we didn't carry out this alternative through the
18 Feasibility Study.

19 The risk, as far as we're concerned, at this point is
20 much too great for us to spend the resources to develop it and
21 then, in the end, it's probably not something that EPA would
22 implement with the Superfund money.

23 So where are we at with looking at this other
24 alternative and with our alternative?

25 We have been meeting recently with the current property

1 owner and his consultants. And clearly, if this proposal were
2 to be technically demonstrated and economically demonstrated
3 to our satisfaction, it's something that EPA would consider
4 having the current property owner do.

5 And the reason is it would solve the environmental
6 problem -- if it worked, technically feasible, economically
7 feasible -- it would solve the problem of the pollution coming
8 from Iron Mountain Mines, it would be solved at no cost to the
9 government, and then in addition, a business would be able to
10 operate from it. It would generate jobs for the area and
11 would bring income to the area.

12 So for those reasons, if the thing can be demonstrated,
13 it is still something that we would consider at a later date.

14 Now, all of you have been seating real patiently. Why
15 don't we take a five-minute break and we'll reconvene and take
16 questions at that point. Thank you.

17 (Recess taken.)

18 ---o0o---

CONTINUED PROCEEDINGS

MR. CLIFFORD: All right. If everybody would please have a seat, I think we could probably get started.

Before we jump into the question-and-answer session, there's one point I'd neglected to mention, and that is throughout this process, there was a technical advisory committee that was composed of a number of state and federal agencies and representatives. And they really contributed a very large part toward the product that we have and are able to review tonight.

I would just like to introduce those people, the ones that are here.

First, Kirk Nordstrom from the U.S. Geological Survey. Kirk, could you stand?

Thank you.

Les Kauffman from the Bureau of Reclamation.

Les.

Tom Carnahan. There's Tom from the U.S. Bureau of Mines.

And who did I miss? Harry Rectenwald from the Department of Fish and Game.

And Dennis Wilson from the Regional Water Quality Control Board, formerly with the Department of Fish and Game.

Now, also up front with us we have three gentlemen from

1 CH2M-Hill, which is the consulting firm that we hired to do
2 the Remedial Investigation and help develop the Feasibility
3 Study.

4 To my far right is Ray Prettyman.

5 On his left is Mike Smith.

6 And on Mike's left is Jay Mackie, all from CH2M-Hill.

7 And they'll be up here to help us field questions.

8 So before I start, could I get a show of hands for
9 those people who are going to have questions? And again, we
10 have two distinct sessions: A question-and-answer period
11 followed by a public comment period.

12 So if I could ask all of you for this portion to please
13 just ask questions, restrict your statement to a question and
14 not address any type of comment. We'll get to the public
15 comment period later.

16 So if I can get a show of hand for those people who
17 have questions that we would like to clear up, just so I can
18 get an idea of how many we're looking at.

19 Four, five, six. Okay. Not too many.

20 Maybe I'll just start right in. And we'll start with
21 this gentleman right here.

22 Could please state your name and then spell it for the
23 reporter, because he needs to get all this down, if that's
24 okay.

25 MR. REGINATO: John Reginato, R-e-g-i-n-a-t-o,

1 General Manager, Shasta Cascade Wonderland.

2 I have a question in relation to the enhancement or
3 movement of streams so you have clean water. Will those
4 grounds be able to -- will they be developed enough so you'll
5 have gravel for spawning, where you have a quality of life
6 restored to those streambeds?

7 MR. PEDRI: What streambeds?

8 MR. REGINATO: You're talking about Spring Creek,
9 Slickrock Creek. Under the alternative plans, you're going to
10 put fresh, clean water down the streams.

11 Are you going to have habitat restored or are you going
12 to have gravel, aquatic life, et cetera?

13 MR. MIX: I think we'll see improvement, but I
14 don't think we'll see the habitat restored to the original
15 condition. It would cost way too much, in excess of
16 approximately \$400 million, to make that sort of cleanup.

17 MR. SMITH: There's no restoration program in the
18 remedial action alternatives presented here today.

19 MR. CLIFFORD: Sir, did that answer your
20 question?

21 MR. REGINATO: Yes, unhappily.

22 MR. CLIFFORD: Okay. I would like to move from
23 my right and across to the left. So there were some other
24 gentlemen here that had a question.

25 Yes, sir. Dan.

1 MR. MCLEAN: Will you please describe "cost
2 effectiveness"? I don't understand what that means, as you
3 have used it.

4 MR. CLIFFORD: Okay. Dan, for the record, spell
5 your name for the reporter?

6 MR. MCLEAN: McLean, M-c Capital L-e-a-n.
7 Initials are D.C.

8 MR. MIX: The definition for the cost-effective
9 solution is the lowest cost alternative that effectively
10 minimizing threats to and adequately protects the public
11 health, the welfare and environment.

12 MR. PEDRI: I think there are no projects
13 pertaining to the Sacrametno River starting at Keswick
14 Reservoir. That was picked because the cost of moving that
15 point up would increase the project tenfold, 20-fold, even
16 more.

17 MR. BOYER: My name is Boyer, Bruce Boyer.

18 The question that I'd like to ask Mr. Pedri, if he took
19 the pictures of the Spring Creek arm when the Spring Creek
20 power plant was in operation or not -- I had two questions --
21 I would like to have him answer that one first.

22 MR. PEDRI: You saw pictures with the power plant
23 on, you saw pictures with the power plant off.

24 MR. BOYER: Okay. And then has the state tested
25 for cadmium in the San Lorenzo River in Santa Cruz County?

1 MR. PEDRI: Yes.

2 MR. BOYER: What did you find?

3 MR. PEDRI: There are high levels of cadmium in
4 the San Lorenzo River as well.

5 MR. BOYER: Okay.

6 MR. CLIFFORD: I forgot to also mention, in
7 addition to stating your name and spelling it for the
8 reporter, if you're also representing another agency or
9 another group, if you could also mention that group or agency.

10 Otherwise, we will assume your questions and/or
11 comments are as a citizen.

12 FROM THE FLOOR: I think it would be helpful if
13 people who ask the questions could stand; and the gentlemen
14 who answer the questions, if they could stand.

15 MR. CLIFFORD: All right. Yes, sir.

16 MR. KENT: Thomas Kent, K-e-n-t. I'm with
17 Stauffer Chemical Company.

18 And I guess my question is directed primarily to
19 CH2M-Hill. In the report I've just seen in the Feasibility
20 Study, it mentions that a final Remedial Investigation report
21 would be issued in August. I was wondering, will that become
22 available shortly, this month, obviously; and if so, is it
23 available for public review?

24 MR. SMITH: Well, the first part of your
25 question, it will be available shortly. And it's up to EPA

1 whether or not it goes back to public review.

2 MR. CLIFFORD: No.

3 Our process -- this is the public review period on the
4 Feasibility Study. And we don't anticipate major changes to
5 the Feasibility Study as it's written.

6 It will be put in there for public review, but not
7 officially distributed for public comment, as a responsive
8 summary to all the comments we get during the public comment
9 period and during tonight's meeting.

10 MR. KENT: Can I rephrase my question?

11 What I am asking was: The final Remedial
12 Investigation, which was the earlier report which presumably
13 the Feasibility Study is in part based on, will that become
14 available in August as stated in the Feasibility Study; and if
15 so, will it be available for public review?

16 MR. MIX: When that report was released last
17 April, it was available for public review for a three-week
18 period.

19 MR. KENT: The final --

20 MR. MIX: The final.

21 MR. KENT: I'm asking about the final one now.

22 MR. MIX: Yes. I know. Usually what happens
23 when we send a draft report out, is at that particular point
24 we'll take the documents, address them and when the final
25 Feasibility Study is released, it should accurately represent

1 all the comments that have been made on the draft.

2 So I would not envision that the final Feasibility
3 Study will be available for public comment.

4 MR. KENT: I wasn't asking again about the final
5 Feasibility Study.

6 MR. MIX: All right.

7 MR. CLIFFORD: So the Remedial Investigation will
8 not go out for public comment in a final form.

9 MR. KENT: I didn't ask for public comment, sir.
10 I asked was the final report going to be available in
11 August, as stated, and would it be available for public
12 review?

13 MR. CLIFFORD: Oh, yes.

14 MR. SMITH: I don't know if it's going to public
15 review. I think a better question for you is can you get a
16 copy of the final investigation.

17 MR. KENT: I was sort of leading up to that.

18 MR. SMITH: I mean, that's still a question that
19 EPA has to answer. I think they can answer that question.

20 MR. MIX: I don't think we would have any
21 difficulty providing copies of the final RR report at the two
22 repositories.

23 MR. CLIFFORD: And at our office in San
24 Francisco.

25 MR. MIX: And at our office.

1 MR. CLIFFORD: Okay. Last chance, folks. I'm
2 moving this way (indicating).

3 MR. ROSS: My name is Stanley E. Ross. I'm a
4 private property owner on Flat Creek near the site of
5 Minnesota station where a proposed diversion of the water of
6 upper Spring Creek has been made into the watershed of Flat
7 Creek, and a flow of, as I understand, 800 cubic feet per
8 second of water would be rushing into my house as a
9 consequence of this study as proposed in most of the combined
10 alternatives outlined in your Feasibility Study and this
11 summary of it I have.

12 Now, it appears to me that in the combined
13 alternatives, there has perhaps been an omission which may be
14 due to the lateness of the proposal made by the City of
15 Redding on the same site, on upper Spring Creek, for the
16 diversion of the waters of upper Spring Creek into a
17 hydroelectric project using a 20-foot diameter penstock,
18 taking the waters of upper Spring Creek into the Keswick Lake
19 area near Matheson's site. That appears to be overlooked.

20 The reason I suggest that it might be overlooked is it
21 would save 800 cubic feet per second of water rushing through
22 my house and would save me a great deal of difficulty.

23 I notice also that the diversion dams of the South Fork
24 Spring Creek is proposed to bring water into Rock Creek, which
25 would cause similar property owner's damage.

16
1 Can the representatives of CH2M-Hill tell me why that
2 alternative was not included in this Feasibility Study and if
3 it's possible to still include it?

4 MR. SMITH: I think I can answer that. First of
5 all, I'm not sure all 800 cfs would go through your house, but
6 that is one of the disadvantages of that alternative.

7 The reason that we did not include the City of Redding
8 pump storage project as a part of our alternative is because
9 there is no assurance that that hydroelectric facility will
10 ever be built. And if the City of Redding is successful in
11 building that hydroelectric project, then that may be done in
12 lieu of this diversion. And that's why it was omitted.

13 I mean, the City of Redding doesn't know yet. I mean,
14 we have a representative here. They don't know yet if they
15 will ever build it.

16 So it's pretty hard for us to take it into account. I
17 think it would be great if they did build it.

18 MR. ROSS: In that event, would the federal
19 government preempt that possibility anyway from the City of
20 Redding, if they, the city, did?

21 MR. SMITH: I'm not sure I understand your
22 question. What do you mean by "preempt it"?

23 MR. ROSS: Well, would the powers of the federal
24 government preempt the powers of the City of Redding as far as
25 that kind of solution went to the problem of diverting upper

1 Spring Creek?

2 MR. SMITH: I'm not sure what the federal
3 government would do in that case.

4 MR. ROSS: Okay.

5 MR. CLIFFORD: I'm not sure I understood the
6 question. Are you asking if we made a decision to divert a
7 portion of Spring Creek and then at some later date, before we
8 actually constructed the diversion, the City of Redding
9 decided to go through with this hydroelectric power plant?

10 MR. ROSS: Right. Excuse me, I'll stand up and
11 address it again.

12 If the City of Redding does decide -- and they have
13 applied for licenses not only from the State of California,
14 but from the Federal Power Regulatory Commission, as I
15 understand it, for licenses to operate this hydro electric
16 plant. One assumes they must be serious about it in order for
17 them to take this step.

18 Well, if they do take this step, would they be given
19 consideration in the generation of a valuable resource,
20 hydroelectric power, which would be quite an asset to have,
21 whereas the proposals of the EPA do not create any valuable
22 asset whatsoever here? If there's an economic factor plus a
23 practical factor involved as far as the diversion of the water
24 in upper Spring Creek.

25 MR. CLIFFORD: The answer is yes, we would

1 consider it.

2 MR. ROSS: Would consider it.

3 MR. MIX: Maybe it's also worth just raising for
4 your own information. In our development of that alternative,
5 we have provided cost estimates to take flood control
6 measures. There would also be energy dissipaters in there.

7 So that flow hopefully wouldn't arrive as a tidal wave.

8 And lastly, the only other point I wanted to make was
9 that we could pay for relocation of residences that could
10 possibly be affected by flooding on Flat Creek. We could move
11 you to higher ground.

12 MR. CLIFFORD: Yes, sir.

13 MR. WILSON: I'm Charlie Wilson.

14 If you solve the problem on Iron Mountain, is that the
15 end of it or is there another source of pollution up there
16 that would still create a problem?

17 MR. PEDRI: I can answer from --

18 In the Spring Creek watershed, there is another source
19 of pollution, but it represents less than one percent of the
20 total metal load in that stream. So by solving the Iron
21 Mountain problem, you would be solving most of the pollution
22 in the Spring Creek drainage.

23 And as the alternatives show, you would be able to
24 protect the fish in the Sacramento river.

25 There are other mines, I think most people are aware,

1 up in Shasta Lake that discharge into the lake. But the
2 levels of those metals entering the Sacramento River system
3 are mitigated by the fact that Shasta Lake is a huge
4 reservoir, it's a huge reservoir of neutral water that tends
5 to precipitate those metals out.

6 So the basic problem would be solved by this proposal.

7 MR. WILSON: Okay.

8 MR. MIX: Can I go ahead and add something to
9 that?

10 If we move forward with a remedial action, we would
11 probably implement the project in phases. And as we construct
12 one alternative, we would then undertake a monitoring program
13 to determine if it was performing as we had expected.

14 And it might be at some point that we may find that we
15 need to take additional corrective measures in order to meet
16 EPA -- EPA cleanup objectives. If that were the case, we
17 would go back up and identify other corrective measures that
18 we can take in order that the downstream water quality water
19 equal objectives would be met.

20 So we won't just build this alternative and walk away
21 without going back in and making sure that it works.

22 MR. CLIFFORD: Yes, sir.

23 MR. FOSTER: There was a comment made as --

24 MR. CLIFFORD: Could you please stand and --

25 MR. FOSTER: My name is Frank Foster. I'm with

1 Iron Mountain Mine.

2 There was a comment made regarding public -- or the
3 acid mine water being detrimental to your skin and putting
4 your eyes out or burning your eyes or something like that.

5 What was the basis of that study or -- I didn't find it
6 in the comments. Where was the conclusion reached?

7 MR. MIX: That was an endangerment that was
8 prepared by the epidemiological unit in Berkley.

9 MR. FOSTER: Based on an opinion rather than a
10 study done?

11 MR. Mix: Based on a review of data at Iron
12 Mountain Mine in consideration, I would have to assume, based
13 on cases nationwide on similar exposure.

14 MR. FOSTER: Because I've worked in the area for
15 the past six or eight years, and nothing's the matter with me.

16 MR. MIX: Other than those twitches, huh?

17 MR. FOSTER: I get it on my eyes and skin and
18 everything. It doesn't bother me.

19 MR. MACKIE: Well, probably the amount and time
20 and strength will enter into the health effects.

21 MR. FOSTER: I guess the --

22 MR. MACKIE: And the strength of your particular
23 exposure may have been different than the generalized
24 statement was.

25 MR. FOSTER: It was right from the --

1 MR. MACKIE: Well, epidemiologists and
2 toxicologists study such things and have information on such
3 things. And the general statement is made if acid drainage is
4 strong enough, it can be harmful.

5 MR. PEDRI: I think it varies to different
6 people. I was incident when those people were plugging with
7 the sandbags. One guy fell in the water and he did get burnt
8 and had to run and get rinsed off. It wasn't on the hand,
9 though.

10 MR. CLIFFORD: Dan McLean.

11 MR. McLEAN: Dan McLean from Iron Mountain Mines.

12 In regard to this discussion, the report intimates that
13 the acid mine water on the property is in the pH range of .5
14 to 1.0, and that under those -- at that low pH, it is strictly
15 an opinion, as I can determine from the report, that this
16 could be detrimental to the eyes, the skin and what not.

17 Now, that impression is not correct. The only water
18 that is that -- is at that low pH is the water from the
19 Richmond Portal, which at this point is totally enclosed in a
20 pipe and flume system going to the copper cementation plant
21 and then directly into the stream with virtually no potential
22 for anyone coming in contact with it.

23 The rest of the water is at a pH of one and a half, two
24 or higher.

25 And I called the mine drainage section of the

1 Pennsylvania State Environmental Division this week to ask
2 them if they had any record of any effect on human beings of
3 acid mine water all the hundred or more years that
4 Pennsylvania has been deluged with acid mine water.

5 The man went and checked with several individuals. And
6 there is no record of anyone ever having been endangered or
7 hurt in any way by acid mine water.

8 So the impression given in the report -- and that is
9 also the basis, one of the strongest bases you have presented
10 for doing the cleanup. There's no basis in fact for that
11 claim.

12 MR. CLIFFORD: If I could -- again, that's a
13 comment. And we'll be -- it will be taken as a public
14 comment.

15 For this portion again, I would like to reiterate, if
16 we could restrict this portion of the discussion to questions
17 and answers, we would appreciate that. Questions.

18 MR. REGINATO: John Reginato, Shasta Cascade
19 Wonderland.

20 I believe Mr. Mix made the comment that there were 30
21 recorded cases of adult fish kills?

22 MR. MIX: Uh-huh.

23 MR. REGINATO: Do you have any record of the
24 number of fry and so forth that were endangered and/or killed
25 by pollution problems?

1 MR. MIX: As I understand it, the very early life
2 stages of fish that could be affected by releases of acid main
3 drainage, it would be very difficult to detect any deaths
4 simply because of visibility, and then also the fact that
5 these early life stages live in the gravel; and if they die
6 off, you probably wouldn't see them anyway.

7 So I don't think that there's any documentation of fish
8 kills for the very early life stages, but I believe that that
9 is suspected.

10 MR. PEDRI: It's more than suspected. The Fish
11 and Game published reports indicate that the adults are less
12 sensitive than the small fish and the developing fish in the
13 gravel.

14 So when you have an adult kill, it's almost guaranteed
15 you have a kill of the smaller fish. You just don't see them
16 in the river.

17 MR. REGINATO: Was there a value placed on the --
18 dollar value in regards to the loss of this resource?

19 MR. MIX: I don't think that we did place a value
20 on that. I think the U.S. Bureau of Reclamation has in the
21 past placed some values on fish, but I could not recall them
22 at this time.

23 MR. PEDRI: Even though no value was placed, that
24 was a goal of the Superfund, was to stop the toxicity of the
25 fish?

1 MR. MIX: And that would be for all life stages
2 of fish, not just the adults.

3 MR. CLIFFORD: Harry, did you want to say
4 something?

5 MR. RECTENWALD: I think it was covered.

6 MR. CLIFFORD: Okay.

7 Yes, Bob.

8 MR. MILLER: Bob Miller.

9 I was just curious on one point. You introduced the
10 technical advisory committee. I wonder if it is strictly
11 policy that only people affiliated with various governmental
12 agencies participate on the advisory committee?

13 This is a two-part question.

14 Do you ever include industry on such a committee?

15 MR. CLIFFORD: The answer is yes, we have
16 included in the past a responsible -- responsible parties have
17 participated on technical advisory committees.

18 MR. MILLER: How about this one?

19 MR. CLIFFORD: As far as I know, they did not
20 participate on this technical advisory committee.

21 MR. MILLER: Okay.

22 MR. CLIFFORD: Yes, ma'am.

23 MS. RARDIN: May name Annette Rardin,
24 R-a-r-d-i-n.

25 Once action has been implemented, how long will it take

1 to clean up Iron Mountain?

2 MR. CLIFFORD: Do we have an estimate of the time
3 to implement --

4 Maybe that would depend on --

5 MR. MIX: That would depend on which alternative
6 was selected.

7 MS. RARDIN: Are we talking about ten years, 20
8 years?

9 MR. MACKIE: It's years and years. The effects
10 to the river to protect it from to the acid main drainage
11 going into it, when that's complete, the benefits are
12 immediate.

13 But the mountain will continue to have a problem for
14 years and years and years to come.

15 MR. RARDIN: So it's not likely that any of the
16 diversion dams would ever be removed probably in our lifetime?

17 MR. MACKIE: It would be a long time. I can't
18 tell what's going to happen 20, 40, 60, a hundred-year basis.
19 It's a long time. It will probably be past our days.

20 Implementing the alternatives, they'll be implemented
21 quickly, but they'll have to remain in place for a very long
22 time.

23 MR. CLIFFORD: Yes, sir.

24 MR. COLLIER: Gary Collier.

25 I'm kind of concerned. You're talking about putting a

1 cap on here.

2 My question is: Would it not be better to provide the
3 drainage to have -- to mop the hill and oil the surface and
4 take measurements to determine whether a cap is going to be
5 sufficient to take care of the situation?

6 There's no sense putting a cap on the hill and putting
7 these folks out of business, because if you put a cap on
8 there, no way they're going to be able to perform a business
9 and mine that area at any time in the future.

10 Whereas if you just test it over a couple of years and
11 determine whether a cap is going to work by oiling the
12 surface, is that not a feasible alternative?

13 MR. PEDRI: I can speak from the state's
14 experience, and we have been up there many more years than
15 even the Superfund was monitoring the relationship between
16 rain and flow out of the portals.

17 And there are direct relationships between water and
18 the Brickflat Pit, and water coming out of the Richmond
19 Portal. The rain in that pit does cause more pollution to
20 come out of the mine. There's no question about it.

21 MR. COLLIER: Okay. But from my understanding,
22 you can provide a drainage out of the side to where the water
23 wouldn't accumulate up there, plus perhaps put some asphalt or
24 an oil, like they oil the forest roads, and the runoff would
25 go through and not accumulate and percolate down.

1 MR. PEDRI: Well, I think that's the intent of
2 the cap. The cap is not going to cap the whole mountain.

3 MR. COLLIER: What I'm saying, how about a
4 temporary cap? Once you put a permanent cap on there, these
5 folks are out of business, right?

6 MR. PEDRI: A cap can be placed. And if they can
7 come up with an alternative --

8 MR. COLLIER: They can do underground, but not
9 surface mining like was done in the past?

10 MR. PEDRI: Not unless the cap is removed, but
11 there's no --

12 MR. COLLIER: But probably that would be -- court
13 orders would be placed against them to did that.

14 MR. PEDRI: But they would have to ameliorate the
15 condition of removing the cap by providing additional
16 treatment of their proposal. As mentioned in this document,
17 it does not include surface mining whatsoever.

18 MR. COLLIER: Okay.

19 My question is: Wouldn't a three-year test or a
20 two-year test to see if the caps even work, wouldn't that be
21 in order instead of putting out 48 mil to find out it doesn't
22 work anyway?

23 MR. CLIFFORD: Well, the 48 million is not simply
24 the cost of the cap. The cost of the cap is a portion of that

25 MR. COLLIER: All right.

1 MR. CLIFFORD: Now, our intent is to clean up the
2 site as quickly as possible.

3 And if we go through this process and the alternative
4 that we select, in fact, involves a cap, that's what we will
5 implement and that's what we'll construct up there.

6 MR. COLLIER: Okay. But you're going to
7 construct the cap. These folks have to foot the bill
8 eventually, right?

9 Why not let them elect to foot the bill for a biannual
10 or annual oiling of the surface to keep the surface runoff
11 from percolating?

12 I know it's a temporary solution, but that way they're
13 not put out of business totally. It doesn't end up as a
14 liability on the property.

15 MR. SMITH: For one thing, we don't know what
16 they're going to do up there. In fact, a cap may help what
17 they're going to do, to begin with, because if they go through
18 a recirculation process, they may want to keep additional
19 water out of the recirculation.

20 Again, we don't know.

21 The other thing, as far as an oil cap, it's not
22 impervious. We're trying to get as impervious a membrane as
23 we can up there to prevent water going through the mountain.

24 Our studies indicate that a cap is going to work. And
25 that's what we're going with as an alternative.

1. MR. PEDRI: Another perspective is for active
2 surface mining, which requires huge equipment and moving
3 tremendous amounts of material, you have to remove more
4 overburden than the other. The cap is going to be incidental
5 in the amount to be removed. It's a drop in the bucket.

6 There's more overburden than the cap will represent.

7 MR. COLLIER: But once that cap is on there, it's
8 going to be horrendous to get a court order -- I'm sure there
9 would be a court order in place so they couldn't take that cap
10 off.

11 They would have to go underneath it and make provisions
12 for the runoff or they couldn't take that cap off.

13 MR. PEDRI: Or provide treatment of the runoff
14 because the cap isn't there. They would have those
15 alternatives. They could remove the cap, but the extra water
16 would have to be treated to levels that would again accomplish
17 the same goals as this project would.

18 MR. COLLIER: Then why, if its feasible to do
19 that --

20 Is it feasible to do that?

21 MR. PEDRI: At tremendously higher costs.

22 MR. COLLIER: Okay.

23 MR. CLIFFORD: Dan McLean.

24 MR. McLEAN: In the computer program, the basis
25 for the calculation seems to be a 72 percent kill on a

1 no-treatment basis; is that correct?

2 MR. SMITH: I don't think so.

3 MR. McLEAN: That's what the table says. In
4 comparing the various alternatives, the basis is no treatment
5 was a 72 percent fish kill.

6 MR. SMITH: One of the years that was calibrated
7 to was 1978. And the no-action alternative was run with a
8 model. The no-action alternative, in other words, none of the
9 alternatives in place, was run by the Bureau of Reclamation
10 earlier in their study, estimated that if salmon would have
11 not been transported in 1978 from the diversion dam at Red
12 Bluff over to the fish hatchery, there was an estimate, using
13 their model, the Bureau of Reclamation, that 72 percent of the
14 fish would have died that were in the river at that time.

15 However, there were no fish in the river, so --

16 MR. McLEAN: So that's just a computer number?

17 MR. SMITH: We took our data from 1978. The
18 Bureau wrote the model. We calibrate for that 72 percent with
19 our model, to calibrate our model so we could come up with the
20 same numbers as they.

21 MR. McLEAN: My question is: What is that 72
22 percent? 72 percent of what?

23 Is it the number of fish within the first 500 feet from
24 the Keswick Dam, the first mile, the first ten miles? Just
25 what does that number represent?

1 And does it represent adult fish or any stage of fish
2 life?

3 MR. SMITH: We have a gentleman in here that did
4 the modeling for us. Maybe I can ask him if he can answer the
5 question. I don't know the answer.

6 Is Ken Iceman in here? Can you answer his question,
7 Ken?

8 MR. ICEMAN: Yes. My name is Ken Iceman. I work
9 for CH2M-Hill.

10 Since we're talking about the Bureau's estimates, I
11 could make an attempt to answer that question from what I know
12 about that particular program, but Les Kauffman is here, too.
13 And it's not probably fair to keep passing the buck, but I
14 think it would be wiser, if we're discussing that particular
15 issue of the Bureau of Reclamation, for that number, that we
16 talk to the Bureau of Reclamation, not go through CH2M-Hill.

17 So I'll ask --

18 MR. KAUFFMAN: Thank you.

19 I'm Lester Kauffman, K-a-u-f-f-m-a-n, with the Bureau.

20 I'm the only Bureau representative here, so I'm without
21 the aid of my computer programmer. But I'll take a stab at
22 that from my best estimate of what I think that the 72 percent
23 meant.

24 It is a computer-generated number. The computer
25 calculated that number based on toxicity data that was -- came

1 from the research department of Fish and Game as to what
2 concentrations of copper, zinc and cadmium would kill certain
3 life stages of the fish.

4 And so the computer, as best as the programmer could do
5 it -- we know that there are certain concentrations which will
6 kill the earlier life stages, there are certain concentrations
7 that will kill the later life stages. And so there was an
8 enormous amount of data that went into it.

9 Beside the concentrations, there was data from the Fish
10 and Wildlife Service as to where the fish might be at certain
11 times in that particular run, where they were in the river.

12 So the computer estimates on the basis of all these
13 data that if so many fish were up in this area, where the
14 concentrations would occur if the concentrations were at that
15 level, then they would be killed.

16 So the percentages -- we tried to then project the
17 percentages, what's the escapement, the returns; that if that
18 many fish were killed, 72 percent of the run, what potential
19 returning run would live.

20 MR. McLEAN: That's the number of fish that would
21 be in what area of the river?

22 MR. KAUFFMAN: Okay.

23 MR. PEDRI: Was that down Clear Creek or
24 Cottonwood Creek? Wasn't there a dividing line in those two
25 creeks?

1 MR. KAUFFMAN: The model went to -- went
2 approximately 60 river miles down from Keswick. So the -- but
3 most spawning does occur up in the upper river.

4 So my guess is that it is 72 percent of the run in the
5 upper Sacramento River.

6 MR. McLEAN: Well, the inference is 72 percent of
7 all the salmon in the river would be killed. To the
8 uninformed and uninitiated, that would be the direct
9 impression you would get. I don't believe this is the case
10 and this is what I'm trying to get clarified.

11 The fish in that section of the river are not the only
12 fish in the Sacramento River that are spawning; is that right?

13 MR. KAUFFMAN: It would be 72 percent of that run
14 of, say -- say the fall run, which would be the major run of
15 the river. And we're saying 72 percent -- it would impact 72
16 percent of the adults that were returning for the fall run in
17 four years or three years.

18 MR. McLEAN: In what section of the river?

19 MR. KAUFFMAN: In the upper Sacramento River.

20 MR. CLIFFORD: Thank you, Les.

21 MR. MILLER: One further question on that line.
22 It seems the Corps of Engineers had --

23 My name is Bob Miller, M-i-l-l-e-r.

24 -- the Corps of Engineers is contemplating some riprap
25 work down on the river below the diversion dam. And it has

1 been stated by Fish and Game people that that riprap deprives
2 the sands and gravels that are needed for spawning in that
3 portion of the river to the point where 85 percent of the
4 spawning fish are killed.

5 Now, if 85 percent are killed by riprap and 72 percent
6 presumably by this, what are we talking about here? Where do
7 we start measuring fish kills? I'm curious.

8 MR. REGINATO: Oh, come on, for Christ sake.

9 MR. CLIFFORD: I think the comment regarding the
10 Department of Fish and Game needs to be cleared up with the
11 Department of Fish and Game. And it is not relevant to our
12 study here, Mr. Miller,

13 It's a figure in the study condition and what the study
14 is based on.

15 MR. PEDRI: No. The 85 percent we're talking
16 about.

17 MR. MILLER: No. This sort of reasoning is what
18 you get out of that. Now, the same reasoning opponents to
19 riprap say 85 percent will be killed by placing riprap.

20 MR. CLIFFORD: Bob, what's your question?

21 MR. MILLER: My question is exactly what
22 significance does that figure have and is it a factual figure
23 and, as Dan asked, to what reach of river does it apply? Is
24 it the river 60 miles downstream? What is it?

25 MR. CLIFFORD: Okay. With respect to the stretch

1 of river that's impacted, all we know right now is that our
2 best guess is that it was the upper 60 miles of the river.
3 We'll get you that answer.

4 Now, the second question was what, Bob?

5 MR. MILLER: Well, what is the 70 percent kill at
6 the Red Bluff diversion dam? Is that still the same 70
7 percent or the 85 percent? What are we talking about in
8 percent of fish kills? I mean, there don't seem to be that
9 many fish to go around.

10 MR. PEDRI: Well, I think you pointed out the
11 point that there's all sorts of factors affecting salmon in
12 the river --

13 MR. MILLER: Right.

14 MR. PEDRI: -- Iron Mountain Mine being one of
15 them.

16 MR. MILLER: Right.

17 MR. PEDRI: But we're here to discuss Iron
18 Mountain Mine.

19 And what the Bureau is saying, I think, is of the fish,
20 assuming no other losses, that 72 percent would be destroyed
21 by the levels of metals in the river. And there might be a
22 reduction from other sources, as well.

23 And if there turns out to be more than a hundred
24 percent from all sources, then we can maybe assume there would
25 be no salmon in a given year.

1 MR. MILLER: And yet the salmon have increased
2 every year.

3 MR. PEDRI: Not every year.

4 MR. CLIFFORD: Okay. Do we have any other
5 questions?

6 Okay. Dan.

7 MR. McLEAN: Dan McLean with Iron Mountain
8 Mines.

9 A big issue has been made in the report over the fact
10 that the Iron Mountain Mines proposal wasn't considered
11 because it couldn't be implemented rapidly enough, and that
12 you were obligated to proceed with your proposals which you
13 could do a lot sooner.

14 Yet in looking through the report, I don't see any --
15 the only date I could find about implementation had to do with
16 water management things, which said that they would be at
17 least three years to get in action. There were no figures
18 given for the neutralization transfer, for example.

19 What sort of dates do you have in mind for implementing
20 the water treatment plants and the diversion dams?

21 MR. CLIFFORD: We don't have any specifics right
22 now, because we haven't made our decision yet. And based on
23 what comes out of these public meetings and in the comment
24 period, and whether or not headquarters accepts our
25 recommendation, that's when we'll know which alternative we've

1 selected.

2 A better answer to the question may be: How long will
3 it take to build the treatment plant?

4 And do we have a rough guess about how long it would
5 take to build a neutralization plant?

6 MR. PRETTYMAN: We're looking at probably a year
7 of design and probably two years to three years under
8 construction.

9 MR. CLIFFORD: Okay.

10 Yes, sir.

11 MR. COLLIER: Okay. Now, when this --

12 MR. CLIFFORD: Could you please repeat your name?

13 MR. COLLIER: I'm sorry. Gary Collier.

14 On this, the Iron Mountain Mines are going to have to
15 pay the cost eventually of building the lime plant?

16 MR. CLIFFORD: Whatever alternative we select,
17 whether it involves a lime neutralization plant or not, we
18 will approach the current property owner at that point.

19 MR. COLLIER: Okay. My second question would be
20 how much government --

21 MR. CLIFFORD: And past property owners.

22 MR. COLLIER: How much government liability is
23 going to be assessed for their contributing factors from the
24 operation of Shasta Dam and Keswick Dam?

25 MR. CLIFFORD: We'll have to decide that at the

1 time we negotiate cost recovery.

2 MR. COLLIER: Does that mean you haven't
3 considered it or it's not going to be considered.

4 MR. CLIFFORD: No. It means we will consider it
5 at that point.

6 Yes, sir, in the back.

7 MR. BOYER: I would like to get back to this
8 gentleman here on the actual part of the river --

9 MR. CLIFFORD: Sorry. Could you please state
10 your name?

11 MR. BOYER: Bruce Boyer. I represent Iron
12 Mountain Mines.

13 And I'd like to know if the Bureau of Reclamation
14 fisheries considers the area between the Shasta Dam or Keswick
15 Dam and Redding as spawning area?

16 MR. PEDRI: I don't know what we consider, but I
17 know there is a spawning reach between Keswick Dam and the
18 City of Redding water intake. And we need this there.

19 There's much more spawning, of course, as you go
20 downstream below the ACID diversion dam, but there is spawning
21 by the ACID diversion dam in one riffle. There's no spawning
22 as far as salmon go.

23 MR. BOYER: What I'm asking: Is there any
24 spawning above Redding?

25 MR. PEDRI: Yes, there is spawning. There is a

1 riffle.

2 MR. BOYER: Where?

3 MR. PEDRI: Between Redding, the ACID diversion
4 dam, which is Redding, there is one riffle that contains
5 spawning fish. Salmon do spawn in that zone.

6 MR. CLIFFORD: Okay. We're approaching 10:00
7 o'clock and I would really like to move into the public
8 comment period, if that's all right.

9 Again, I'd like to lay some ground rules. For the sake
10 of time, I'd like to ask each of the commenters to attempt to
11 limit their comments to no more than ten minutes, for the sake
12 of this meeting.

13 Of course, anything that's submitted in writing we'll
14 consider, also. So to the extent that commenters could limit
15 their public comment to ten minutes, it would be appreciated.

16 Could I get a show of hands again for those who would
17 like to make comments? Could you just hold them up? I would
18 like to get a count.

19 One, two, three, four, five, six, seven, eight, nine,
20 ten, 11 --

21 Ma'am, were you going to comment.

22 FROM THE FLOOR: No.

23 MR. CLIFFORD: 11. Okay.

24 Did I miss you, Frank?

25 Okay. 12.

1 FROM THE FLOOR: Could I ask one question?
2 Perhaps we could start with three minutes before we get to the
3 tens.

4 MR. CLIFFORD: Yes. That's a good idea.

5 I know it's getting late and I appreciate all of you
6 bearing with us on this. So why don't we start with those who
7 have rather brief comments.

8 Floor right here.

9 MR. CLIFFORD: And there isn't necessarily a need
10 to speak at the podium, but if you could stand, again state
11 your name and spell it for the court reporter, I'd appreciate
12 it.

13 Okay.

14 MR. NOR: My name is Orwig Nor, O-r-w-i-g. And I
15 represent myself.

16 And I'm a life-long resident of Shasta County and Iron
17 Mountain many years ago. More than I want to think about.

18 My only document here this evening is I'm not here to
19 speak to the current owners or past owners or future owners,
20 they'll have to solve their own problems with EPA and the
21 Water Control.

22 But as an interested Shasta County residence who has
23 been aware of the economic impact that Iron Mountain Mine had
24 on this county for many, many years -- and it was
25 considerable. At one time it was the largest employer in

1 Shasta County. We all realize it won't be that again.

2 I simply would ask the EPA and all the other concerned
3 agencies to make it a focal point of their investigation to
4 consider the economic -- potential economic benefits of a
5 considerable, a viable mining operation.

6 I was a little surprised you have spent 900,000 bucks
7 of the taxpayers' money to come up with seven alternatives. I
8 certainly wouldn't quarrel with them on their technical
9 aspect, but you have not considered that maybe all your
10 problems could be solved or certainly some of your problems
11 solved by someone taking the mine and doing a mining
12 operation.

13 Again, I'm not talking about the current people or
14 anybody else, but I think if you're not that, you're not
15 looking at all the alternatives.

16 And while the EPA is not in the private enterprise
17 business, the government is certainly in the mining business.
18 You have the Bureau of Mines.

19 I think you really need to make that a public part of
20 whatever ongoing investigation you do at this time.

21 I don't see any conflict with the EPA and state people
22 doing something such as raising the Spring Creek dam and also
23 having the private people do whatever they're going to do. I
24 don't see that it has to be all the government project or all
25 somebody else's project.

1 MR. CLIFFORD: Thank you. Is there someone else
2 who had a relative briefly comment that they would like to
3 make?

4 Yes, sir.

5 MR. REGINATO: John Reginato. Shasta Cascade
6 Wonderland Association.

7 I have a few notes here. I would recommend, of course,
8 to EPA that --

9 We've discussed the problems on the Mountain Copper
10 Company for over 35 years. I can recall that 30 years ago we
11 were instrumental in getting the Wildlife Conservation Board
12 to have the Philadelphia Academy of Sciences make a study of
13 the problem. The problems haven't changed that significantly.

14 But during this interim period there has been a
15 tremendous impact on the fishery resources, as for example,
16 there's a sterile section of Keswick Lake which actually runs
17 from the dam all the way up to Spring Creek.

18 Now, in contrast, take Lewiston lake, which is the same
19 type of regulatory reservoir, probably one of the finer
20 fisheries you'll find in Trinity County as far as a CV
21 project.

22 The salmon resources are a very important part of our
23 economic prosperity in the future. Tourism -- the business
24 I'm in is tourism promotion. If we don't have these
25 resources, we're going to go the same route as the timber

1 industry and other resources in northern California.

2 We would recommend, for example, that you've got to get
3 the pollutants out of the Sacramento River, whether this takes
4 a cap or building an additional larger reservoir.

5 As far as the Spring Creek debris dam is concerned,
6 whatever is necessary. I think we can't dilly-dally and delay
7 any further than we have at this particular time.

8 We have a serious problem, for example, and may be
9 occurring just within several months from now when the Bureau
10 of Reclamation is contemplating reducing the flows to the
11 Sacramento River down to 2800 cfs -- where normally you would
12 get getting anywhere from four to six thousand -- because of
13 the dry year that we have had.

14 Now, we're not -- we can't depend upon the Bureau of
15 Reclamation to take the fishery's concern. They're going to
16 look at flood control first. They're going to look at power.
17 They're going to look at agricultural commitments, as far as
18 irrigation is concerned.

19 But when it comes to fishery resources, their track
20 record is very negligible, with all due respect to the
21 gentleman here representing the Bureau.

22 We would think the Spring Creek diversion -- one of
23 your own men I have talked to, Joe Patton, has indicated that
24 he has some grave concerns. And Joe Patton was responsible
25 for coming up with the visionary idea of having the first

1 debris control dam when he was with the Shasta County
2 Department of Water Resource. We think the enlargement of the
3 debris dam at the outset would be very significant.

4 And we urge nothing be left to chance. This resource
5 in the Sacramento River, the salmon, the steelhead, the trout,
6 is too valuable a resource to let go down the pike.

7 And I will be one of the first ones to admit that
8 pollution from Spring Creek is only one of the problems.
9 There are other problems that I'm sure the EPA and other
10 fishery experts are well aware of.

11 But I don't think -- I want to emphasize one further
12 time that we cannot delay any further getting something done,
13 some capital improvements down to Spring -- on the Mountain
14 Copper Company so we don't contain or have this constant
15 pollution problem which affects our resources.

16 MR. CLIFFORD: Thank you very much.

17 Another relatively short --

18 MR. WAISS: Yes.

19 MR. CLIFFORD: Okay.

20 MR. WAISS: I'm Frederick Waiss, W-a-i-s-s. And
21 I am appearing for Stauffer Chemical Company.

22 Stauffer, while it has never conducted any mining on
23 this property, was, from 1967 to 1976, the owner of the
24 property. And during that period, it did have experience in
25 operating the copper cementation unit for the purpose of

1 removing, as much as possible, copper from the waters flowing
2 from the portals.

3 Now, while the comment period began on August 2nd, the
4 report on which we are asked to comment was not available to
5 us until August the 8th. And the study raises some very
6 significant questions which do call for comment, but it will
7 not be feasible for us to make any meaningful comments by
8 August 23rd, one week from now.

9 In view of the importance of the decisions to be made,
10 we ask that the agency allow some -- a very reasonable
11 additional amount of time so that we can have the opportunity
12 to make these comments.

13 One thing that does seem clear is that more serious
14 consideration should probably be given to the in situ mining
15 proposal being made by Iron Mountain Mines.

16 Just as the first commentor said, none of these other
17 proposals involve the maintenance of a viable operation up
18 there by way of any mining operations or any -- the benefits
19 that would flow from a successful mine operation there.

20 Certainly, in view of the amount of time that has
21 already been spent in studying this project, some additional
22 time should be allowed so that consideration of such an
23 alternative -- and there may be others -- be included as part
24 of the government's study.

25 We ask that you do allow time until the end of

1 September for the making of additional comments -- or at least
2 in additional time over and above what is now allowed.

3 Thank you.

4 MR. CLIFFORD: Okay.

5 MR. TURK: My name is Tom Turk. I'm with Davy
6 McKee Corporation. We're the engineering design and
7 construction consultants for Iron Mountain.

8 Now, I just wanted to make one brief comment on the
9 program, on the schedule for the work. A comment was made
10 from the table here a little earlier that it would be
11 approximately a year's design and two to three years'
12 construction for a neutralization facility.

13 Our experience in building these types of operations --
14 and we've just recently completed one down in Napa County --
15 would be that we could do this entire program within 18 to 24
16 months.

17 And that would include also the design of the
18 processing facilities themselves. So in terms of our scope,
19 what we're looking at is for a schedule of 18 to 24 months,
20 complete.

21 MR. CLIFFORD: Thank you, Mr. Turk.

22 Okay. Are there any other -- anybody else out there
23 who has a brief comment that would like to go ahead and get it
24 out of the way?

25 Yes, sir.

1 MR. COLLIER: Gary Collier.

2 My main comment is just that I think there should be
3 more examination of what the government has done to exacerbate
4 the problem. Probably they should allow a little leeway
5 towards the people that presently own the company to maintain
6 the premises and hopefully get an edge on the problem without
7 totally closing them down.

8 MR. CLIFFORD: Okay. Thank you.

9 MR. COLLIER: Yes, sir.

10 MR. CLIFFORD: Yes, sir.

11 MR. FOSTER: May name is Frank Foster. I'm with
12 Iron Mountain Mines. I have just some brief comments
13 regarding the specifics that I saw in the study.

14 The study was based on the fact that we are ranked No.
15 3. I think it's real important that all of you realize that
16 the reason we were No. 3 is because it was based on some
17 totally erroneous and fraudulent reporting that put us on the
18 hazardous waste list in the first place.

19 That's just not an idle statement.

20 The study being discussed tonight, and contracted for
21 by EPA from CH2M-Hill at a cost of of approximately \$900,000,
22 tentatively identifies only two problems, potential problems:
23 One, possibly a threat to the drinking water for the City of
24 Redding, which, by their own report under even the worst case
25 conditions, over the past hundred years, this has not

1 happened, and mineral in the water is getting less and less
2 every year anyway.

3 The other is possibly because of a fish kill in the
4 Sacramento River, this possible cause being based on a
5 computer model projection by Water Quality Control and
6 California Fish and Game Department, which included, among
7 other erroneous criteria, the assumption that there are
8 spawning beds between Keswick Dam and the City of Redding,
9 which there are not.

10 Jim says there's one small riffle above the dam, the
11 ACID dam or something that you called it, which is --

12 How far is that riffle above the dam? Very far?

13 MR. PEDRI: Almost a mile.

14 MR. FOSTER: Almost a mile. So the other five or
15 six miles below Keswick Dam has been wiped out of any spawning
16 beds, yet that area is plugged into the computers and
17 supposedly represents where a lot of the fish were killed.

18 Results of the study indicate that -- regarding
19 Redding's drinking water, and this is a direct quote:

20 "There are no known measured concentrations of
21 cadmium in the city's finished water that
22 exceed drinking water standards."

23 We didn't find where it had even come close.

24 There's a scenario that they quote regarding the eating
25 of 60 meals of fish for a year from Keswick Lake, with these

1 fish containing the highest recorded metal content, unless you
2 eat the fish livers. I don't care for fish liver, myself. I
3 don't know if anybody does.

4 But eating this 60 meals of fish out of Keswick, this
5 represents -- a direct quote:

6 "This represents only a small fraction of the
7 normal total cadmium intake, and therefore
8 does not appear to represent a significant
9 public health threat."

10 Well, those are the items that the -- the potential
11 problems. And they turned around and say really they aren't a
12 problem.

13 A little further on, of the documented fish kills that
14 are in the report attributed to acid mine drainage from Iron
15 Mountain Mines, actually there were only three of them that
16 were at the mouth of Spring Creek. The other 30 documented
17 kills, they were in Shasta Lake. And that's quite a ways
18 upriver from Spring Creek.

19 Below Shasta Dam, that's quite a ways upriver from
20 Spring Creek. Below Keswick Dam and at Redding.

21 But if there's fish being killed below Keswick,
22 Redding, there should have been some dead fish at the mouth of
23 Spring Creek, too. These are again computer projections.

24 The proposed objectives are all designed to mitigate
25 the two potential problems identified in item two above,

1 possibly drinking water and possibly fish kill, at an expense
2 of 5.6 million to \$2 billion of direct cost of taxpayers'
3 money through the Superfund program.

4 These proposed alternatives would be a continuing cost
5 for as long as it continues to rain in the Redding area.
6 EPA's plan would completely destroy all possibilities of
7 mineral production and income. Therefore the recovery of cost
8 for alternatives would be impossible and would ultimately
9 leave the taxpayer stuck with the bill.

10 Iron Mountain Mines' proposal, which was mentioned
11 briefly, is an economically and environmentally sound proposal
12 and will not only alleviate the two potential problems of
13 drinking water and fish kill, but will also recover the huge
14 strategic mineral resources at Iron Mountain.

15 This process does not flood the mine, as is stated in
16 the report. In a recirculation system, you can't flood it.
17 You just keep a little water running through it. Really, it
18 enhances what mother nature is already doing, except we would
19 control it.

20 The process -- in the event of a natural disaster,
21 there is no catastrophic release of the water like there can
22 at Mammoth, where there's a plug in the mine.

23 There would be only a shut down. And within a very
24 short period of a few hours, the water drainage would be no
25 more or no less than it is right now, which is only a minor

1 problem anyway, if any.

2 Iron Mountain Mine, Inc's operation will be under the
3 supervision and management of the David McKee Corporation, a
4 worldwide prestigious engineering company which has
5 specialized in the recovery and environmental problems of
6 recovery of these types of ore bodies for many years.

7 It is possible, as indicated in this study -- and
8 there's a section in the study that covers this -- that EPA,
9 Water Quality Control and CH2M-Hill does not understand the
10 state of the art technology involved in Iron Mountain Mines'
11 proposal and really should not be evaluating the project.

12 In addition, Iron Mountain Mines' projects will create
13 three million annual payroll dollars for the local work force,
14 which in turn has a \$21 million annual financial impact on the
15 City of Redding.

16 Iron Mountain Mines has been working diligently over
17 the past nine years to implement this plan which will
18 contribute greatly to the economic growth of Redding.

19 It's hoped that we will all think about what the Water
20 Equal Control Board and EPA are attempting to do to your
21 community, as well as take an active interest in supporting
22 active mountain mines in developing a large payroll and a
23 financial -- positive financial impact on the City of Redding.

24 Thank you.

25 MR. CLIFFORD: Thank you.

1 If I could ask everyone else to attempt to keep to the
2 ten-minute time limit, I would appreciate it.

3 MR. BOYER: My name is Bruce Boyer. I'm a
4 consultant with the -- for the Iron Mountain Mines. And there
5 are a few things that I would like to comment on here.

6 And one of the ones has been commented on before,
7 dermal contact with acid mine drainage. And they mention in
8 the Feasibility Study that it can be very dangerous to your
9 eyes and so forth.

10 Actually, it will smart if it gets in your eyes, but
11 there's no permanent injury. Perhaps out of the -- right out
12 of the portal, it would be more damaging, but not very much.

13 Actually, I have drank water that comes out of the
14 debris dam at pH 3, no ill effects.

15 Now, environmental concerns. Environmental concerns of
16 the fisheries in the Sacramento River are misleading. The
17 statement discharges from Iron Mountain Mines has caused
18 numerous fish kills in the Sacramento River has no basis in
19 fact.

20 Actually, counts of fish perhaps were made. However,
21 autopsies of the carcasses and analysis were never made. And
22 so therefore copper or cadmium or something that might kill
23 the fish was actually never known up until recently when the
24 Department of Fish and Game did actually autopsy in fishes.

25 And they did find one fish that was swimming around in

1 perfectly good health with four parts per million cadmium in
2 his liver.

3 The decline of anadromous fishes was particularly
4 noticeable after the Shasta and Keswick dams were built. That
5 is, it actually stopped the spawning grounds north of Keswick
6 and, in fact, north of Redding.

7 Indeed, another obstacle to the fisheries is the Red
8 Bluff diversion dam. And this was very well proven this year,
9 because when they did change the site -- let's see, in 1944,
10 they made -- or '84 they made some improvements down there.
11 And '84, after that, was the highest fish run in ten years, at
12 least a decade.

13 Ingestion of water is unlikely, of course, because of
14 its metallic taste. Actually, the taste of the water out of
15 the debris dam is quite metallic. So I don't think anybody is
16 going to be drinking enough to actually poison themselves.
17 They might get a few essential minerals that they need for
18 their own health and livelihood from this.

19 And of course, the concerns about Redding drinking
20 water have been addressed already. And there is absolutley no
21 danger there from the amount of cadmium that is going down the
22 river at the present time, or even in extended amounts.

23 Now we'll go to work on this computer that we've been
24 talking about, the computerized fish kill. I have the
25 original work that was done on the actual work that determined

1 the levels of copper, zinc and aluminum cadmium that were
2 instrumental in killing the fish.

3 And actually, the errors in the laboratory techniques
4 that were done in that part of it should not have been
5 allowed. Actually, they had to add reagent grade of agent --
6 of chemicals to the water to keep enough of the chemicals in
7 the water to get the mortality on the fish that they desired.

8 Therefore, the computerized projections and
9 extrapolations from this poor experimental evidence is
10 worthless.

11 It is my professional opinion that the hazards to fish
12 from Iron Mountain Mine are small and much overrated,
13 overblown and overpublicized.

14 Now, I'd like to make a couple of comments on
15 CH2M-Hill's report here. And if I can get this thing to
16 working again here, I can show you something that I would like
17 you to look at.

18 Now, actually -- first of all, I want to show you a
19 page out of the report here. Let's see if we can get this in
20 a little bit better focus here.

21 Now, on this you will see that there are one, two,
22 three errors. And CH2M-Hill explains these errors. No
23 identifiable reason for higher soluble concentrations of
24 components, total concentrations to the total -- to the total
25 concentrations of the constituents.

1 Well, they know and we know that actually the total
2 metals in the water is going to have to add up to only a
3 hundred percent and that you cannot have more soluble metals
4 in the water than you can total metals.

5 And this not only occurs on this page, but another page
6 in there. I don't happen to have the -- wait. Maybe we do
7 have it.

8 But after all, if they knew that these mistakes were in
9 this book -- and it's full of them -- why the corrections
10 weren't made?

11 If I put out a report like this, my supervisor or my
12 business would be down the drain in a hurry. And so these are
13 some of the actual reports that we can see here.

14 But how many more are there in the book when there's
15 this many on one page? And there's another page of them that
16 is just as bad.

17 Now, this brings me to another subject here. You can
18 see the sulfates here (indicating). Sulfates can be used for
19 a marker for the amount of heavy metals delivered to a river
20 or to a stream.

21 Actually, what happens is that the ore bodies are
22 decomposed and and go into the river as sulfates. The
23 buffering agents in the river precipitate the metals out,
24 leaving the sulfates there, which are still soluble.

25 And if you look at these figures, you can see here that

1 actually the sulfate increase between the Shasta Dam or above
2 Keswick -- above the Spring Creek arm and between -- between
3 Keswick Reservoir and the end of the dam is only a small
4 portion of what's in there. Actually, it calculates to 11.5
5 in this case.

6 I had calculated 23.5 on an earlier one that the Fish
7 and Game had done, for sulfates.

8 And actually, this is an indicator that the buffering
9 up in the Sacramento Dam -- or the Shasta Dam and the upper
10 Sacramento River is used up. And by the time that it gets
11 down to Spring Creek, most of that buffering is used up. And
12 therefore, the metals do rise higher for a longer time in the
13 river at that point, but certainly not the one percent -- or
14 the 99 percent that was mentioned here earlier in the
15 dissertation.

16 MR. CLIFFORD: Excuse me, Mr. Boyer. We're kind
17 of running a little over on time. Do you think you could wrap
18 up?

19 MR. BOYER: Okay.

20 MR. CLIFFORD: Thank you.

21 MR. BOYER: I'm just finishing my comments now.

22 And I think that the engineers that are responsible for
23 such nonsense in a \$900,000 report need their professional
24 engineer's license looked at, and especially when they
25 actually admit the mistake and there's no correction.

1 Thank you.

2 MR. CLIFFORD: Thank you.

3 Harry.

4 MR. RECTENWALD: My name the Harry Rectenwald.
5 I'm with the California Department of Fish and Game. Spelled
6 R-e-c-t-e-n-w-a-l-d.

7 There seems to be a little bit of confusion about the
8 fish toxicity work. I thought I would just briefly go over
9 it.

10 The first point on documented fish kills, the
11 Department files show that the fish kills occur below the
12 Spring Creek discharge. And there's a long history of the
13 fish kills.

14 A person has to understand that when a biologist goes
15 out to investigate a fish kill, it's -- in a river the size of
16 the Sacramento River, it's not easy to determine the extent of
17 that kill.

18 As you've seen, it's during the wet season, the river
19 is high, there's a lot of water in the rivers, it's usually
20 turbid. You have to understand the life cycle of the
21 anadromous fish. They have their young in the gravel. And
22 those are not to be viewed, either alive or dead.

23 Certainly, when we have views of adult fish kills of
24 adult fishes, certainly we know we get kills of younger fish
25 in delicate life stages.

1 The way we have been able to determine the extent of
2 the problem is by doing very extensive toxicity studies with
3 waters from that area that match the same hardness. And we
4 can take that data -- and it's good data, it's been reported
5 in scientific journals and given a lot of peer review -- we
6 can take that data, and the U.S. Bureau of Reclamation has
7 derived a model to apply that chemical concentration along the
8 length of the river and come up with a -- with a good
9 assertion of what went on in terms of fish populations.

10 The approach in the model using a percent of the
11 population is believed to have an important way to go at it,
12 because the potential for the upper Sacramento River run is
13 greater than it is now today. So a percentage approach gives
14 you the alternative of seeing what the losses might be when
15 the river -- when the run achieves its full potential.

16 Thank you for the the opportunity to comment.

17 MR. CLIFFORD: Thank you.

18 Next commentor?

19 MR. SIEMERING My name is Bill Siemering,
20 S-i-e-m-e-r-i-n-g. I live in Redding.

21 Some time ago when rockets were slow, Aerojet General
22 in Sacramento took it upon themselves to develop a
23 demineralization process. The work was done by a man named
24 Art Fitzacky and -- which I won't spell for you -- and he is a
25 senior research scientist at Aerojet General and also happens

1 to be married to my wife's sister.

2 And he was going to -- he came in possession of a pilot
3 plant that was developed for this process. And he now has
4 this, with the blessings of Aeorjet General. And he did have
5 plans to move this down to the Kesterson project.

6 And I pointed this problem out to him. And we will be
7 moving this pilot plant up to the Boulder Creek plant within
8 three to five weeks from now. So we'll see some results
9 fairly rapidly from that.

10 If none of this works out, I'll be back as a
11 representative of GenStar Cement Company and we will supply
12 the cement for putting the cap on the mountain.

13 MR. CLIFFORD: Thank you.

14 Dan,

15 MR. McLEAN: My name is Dan McLean. And I'm the
16 metallurgical consultant for Iron Mountain Mines.

17 I'm a registered professional chemical and
18 metallurgical engineer. And for 40 years I have been in the
19 mineral processing and chemical processing business, both on
20 design of process development and operating -- in the
21 operating aspects of the business.

22 I also have about 20 years of experience with the
23 design and operation of industrial waste treatment systems,
24 and particularly acid mine water.

25 I was a participant and consultant to the EPA pilot

1 plant installation operated by Penn State University in
2 Hollywood, Pennsylvania for the years 1965 through 1969, and
3 have a lot of firsthand experience with mine water and all the
4 problems associated with treating it.

5 Therefore, I feel I'm qualified to critique this report
6 pretty much on the whole -- the whole spectrum of technology
7 developed. And my comments, then, are in that -- within that
8 framework of expertise.

9 Frankly, as a professional report, I was greatly
10 disappointed in what I read. In general, this EPA-funded
11 report is vague, inconclusive, it's contradictory, it's
12 deliberately misleading and it's highly biased.

13 Particularly, it contains ample evidence to indicate a
14 total lack of competence to deal with the engineering and
15 logistical aspects involved.

16 Specifically, I wish to address the concerns expressed
17 in the report regarding the Iron Mountain Mines' proposal. It
18 first had to do with solution -- the solution mining process.
19 The one proposed is used throughout the world at flow rates up
20 to 8,000 gpm. There's no doubt about the thing being a viable
21 operation.

22 And this process will not increase mine drainage as
23 insisted upon in the report. What it does is maintain a large
24 continuous recycle stream of process water that never leaves
25 the site or system. Any water discharge from the property

1 under our proposal is of high quality, the same or better than
2 the water that would come from the EPA-proposed neutralization
3 plants.

4 Also we wish to emphasize, as has been mentioned
5 earlier, that contrary to what is stated in the report, the
6 mine is not flooded, but does maintain a pool, an operating
7 pool, five to ten feet deep from the bottom level of the
8 Richmond mine.

9 All of the concerns expressed regarding the reliability
10 of Iron Mine proposal indicate a total lack of the knowledge
11 of higher metallurgical plant design and operation.

12 All of the concerns are obvious and fully covered in
13 the design and have been explained to the writers on several
14 occasions.

15 The IMMI proposal has the following major elements. It
16 is a technically and economically viable mining and chemical
17 process facility being designed by a highly competent design
18 organization, Davy McKee.

19 And I would like to cite the economical viability.
20 This operation would have a total sales of approximately \$20
21 million a year. It would cost 15 to \$20 million capital
22 costs.

23 Its operating costs would be of the order of \$26,000 a
24 day. It will have a payout time of about five years and a
25 return on investment of 20 percent. And that, in any man's

1 language, is a viable operation, and can be backed up by
2 reliable figures.

3 Our proposal provides for the full treatment of the
4 five major water pollution sources, several surface sources
5 and various waste piles on the property. It is the equivalent
6 or better than any of the alternatives offered in the proposal
7 and much more cost effective, by their own definition.

8 We're talking about a total expenditure of \$20 million
9 in contrast to the astronomical numbers you have mentioned
10 here for all non-productive processes.

11 It's presents no threat to public health for basin
12 water quality under any reasonable conditions and accomplishes
13 all of the objectives cited by the EPA and the Water Quality
14 Board.

15 So we have no conflict in trying to reach the same
16 objectives while bringing into existence a healthy commercial
17 operation.

18 In contrast to the expense of the non-productive
19 alternatives proposed in the study, the IMMI plant is a
20 viable, productive industry, the benefits of which have been
21 recited previously.

22 Regarding implementation, the work is already in
23 process at Davy McKee on the designs. And tentative project
24 financing has been arranged. Our schedule is for production
25 to start within two years.

1 Mine water treatment plants would be in operation
2 within 15 months.

3 Incidentally, the plant -- our plan includes two water
4 treatment plants, one on each side of the mountain. Those
5 would be put into operation within 15 months. And initial
6 site activities would start within three to four months.

7 And you can see for yourself, in contrast to what is
8 stated in the study, this would be a far more rapid program
9 than anything we have heard being offered from the study.

10 Now, despite the fact that the IMMI proposal is equal
11 or superior to any of the study alternatives and meets all the
12 environmental objectives, this report bends or over backwards
13 in an attempt to discredit the IMMI proposal, primarily on the
14 basis of pleading ignorance.

15 Now, Section C of the report contains 28 pages of
16 responses to a list of questions submitted by the EPA. And
17 yet these things -- these responses seem to have been ignored
18 or forgotten.

19 Certainly, they weren't taken into account if the
20 report is up to date.

21 Now, if the EPA had all these questions that they say
22 they can't answer, there has not been one phone call from
23 CH2M-Hill, EPA or the Water Board trying to obtain additional
24 information. And with a program this important, with the
25 amount of money involved, you would think that anyone with a

1 real interest in accomplishing the best or coming up with the
2 best possible answer would at least make an attempt to get
3 some additional answers, if they feel they don't have them.

4 And we have called these people on several occasions
5 and said do you have any questions? And if you have them,
6 please call us. We would be happy to tell you whatever you
7 want to know.

8 Since what we're proposing has met with the kind of
9 objections we have heard here tonight, the only logical
10 explanation for this type of action is that EPA's main
11 interest is to spend Superfund money on an essentially
12 innocuous site and is purely for political reasons.

13 There are any number of hazardous waste sites in this
14 state that are far worse and that need this money applied to
15 them than Iron Mountain Mines, and everybody knows it.

16 Now, IMMI will continue to furnish EPA with new
17 information as rapidly as it is generated by David McKee, with
18 the hope that our proposal will be given the full
19 consideration it deserves.

20 IMMI will also be happy to supply information to any
21 public or commercial operation interested regarding any aspect
22 of the IMMI operation.

23 Thank you.

24 MR. CLIFFORD: Thank you:

25 MR. MILLER: My name is Bob Miller. I'm here

1 right now representing myself as a citizen of this state and
2 the United States.

3 Yes, I have been on the payroll of the Iron Mountain
4 Mines. I have been on the payroll of EPA. I've been on the
5 payroll of the State Board. So I've been paid by the various
6 government agencies that you've heard talk to you here
7 tonight.

8 I am in private practice now. I'm a professional
9 engineer in this state. But that has no bearing on what I
10 propose to say to you.

11 I don't propose to comment on the technical adequacy of
12 the various alternatives that you've heard. The experts have
13 already told you what they think of them. So my opinion is
14 not in that regard.

15 My opinion as a taxpayer is seeing my tax dollar go to
16 the best possible use. Iron Mountain Mines has proposed a
17 plan which will do everything that any of the alternatives are
18 proposing to do. They plan to do it with private capital, not
19 our taxpayers dollars.

20 And as Dan said, there are a lot of pollutant sites in
21 the State of California that are more in need of Superfund
22 money than Iron Mountain Mines.

23 Of course, Jim will disagree with that because Jim said
24 that he sees Superfund as the only way to protect fish. Kind
25 of a rash statement, when you have private capital that will

1 do the same thing.

2 My only concern is seeing my tax dollar go where it's
3 going to get the most bang. And it certainly isn't going to
4 get the most bang up here when you have private capital that
5 will do the same thing.

6 Thank you.

7 MR. CLIFFORD: Thank you, Mr. Miller.

8 Are there any -- is there anybody else out there that
9 would like to make a statement here tonight?

10 (No response.)

11 MR. CLIFFORD: If not -- oh, I'm sorry.

12 MR. MORGAN: My name is Paul Morgan. I'm with
13 David McKee Corporation.

14 I would like to -- a lot of the things I wanted to say
15 have been said over and over again. And with the lateness of
16 the hour, I'll ignore those and not repeat what over people
17 have said.

18 One of the things I would like to reaffirm is that the
19 report was difficult to obtain. We have been working closely
20 with these people and still a specific request to obtain these
21 documents was again impeded on the 2nd of the month. It
22 wasn't till the 9th, until the end of the day on the 9th, when
23 we finally received a copy, and not when we asked for it.

24 There has been a lot of concern here in this report
25 about water quality standards. And they keep talking about

1 drinking water standards.

2 And one of the things I would like to say is that if we
3 had to have drinking water standards in streams, about 50
4 percent of the water treatment plants in this country would be
5 shut down. Drinking water standards are applied at the
6 discharge of the plant into the distribution system, not in
7 the intake.

8 The other thing, I, like Mr. McLean, have a lot of
9 experience in acid mine drainage, both for the EPA and its
10 predecessor, the FEPA, WPA, FWPA.

11 In a lot of these projects that we did, I would like to
12 comment about this idea that people are going to be blinded.
13 If a hiker happens to leave Redding and walk nine miles on to
14 private property where he's a trespasser and would happen to
15 come in contact with the acid mine drainage water, all I've
16 got to say is I don't see a lot of blind people in excess in
17 Shasta County, and yet that mines been operating for a hundred
18 and twenty-five years.

19 And I think the same thing is true in Appalachia. In
20 Appalachia, all the boys and girls that skinny-dipped in the
21 river would certainly be blind, because a lot of those streams
22 were the same pH conditions we're talking about here.

23 But one of the things I did want to point out is that
24 Davy McKee Corporation builds plants similar to this all over
25 the world. One of the prime considerations of these plants is

1 to make sure that we follow the environmental regulations of
2 that particular state and country.

3 We are just completing a plant for the Homestake Mining
4 Company. That particular mine has more permits for a mine
5 than I've ever witnessed anywhere else in my experience. It's
6 not a nuclear power plant that you can measure permits in the
7 thousands, but this particular plant has accomplished two
8 hundred and seventy-four permits.

9 And if you check the waters in that -- in that old
10 mine -- and it's again an old mining district just like this
11 one that was again mined since the 1860's -- and I'm sure if
12 you checked, you found that those streams in many cases, the
13 lot of seeps you had were like you have here. They produced
14 acid mine drainage of various sorts and it disturbed various
15 of the streams there.

16 But we have awards and letters of commendation from the
17 Sierra Club and from California Department of Fish and Game
18 and people like this who have testified that we have followed
19 all the rules and regulations.

20 There are comments made in this report that says that
21 we are going to -- we have ignored regulations and things of
22 this nature. That certainly is not our intention.

23 Any plant that we design or build here will meet all of
24 the state, federal and local regulations.

25 I thank you.

1 MR. CLIFFORD: Thanks, Mr. Morgan.

2 Okay. One last call. Is there anybody else out there
3 that would like to make a statement here today?

4 MR. PEDRI: Just a quick public statement on
5 behalf of the Board.

6 MR. CLIFFORD: Okay. Can I ask you to stand over
7 there?

8 MR. PEDRI: I just wanted to make a -- some
9 statements have been alluded to that the Water Board has made.
10 And I would like to clarify things and reiterate some things I
11 said earlier.

12 First of all, I have been involved in the pollution
13 problems at Iron Mountain Mine since 1975. I have seen fish
14 die. The pictures do not lie. They show a problem.

15 We have a problem there. I think even Iron Mountain
16 Mine admits that.

17 The solution needs to come quickly. The concern of the
18 state has always been -- on the part of Iron Mountain Mine
19 coming up with a solution, we have always had promises. We
20 have had promises every year since 1975.

21 There's no change today since '75, other than some
22 minor modification that our orders required in copper
23 cementation plants on Slickrock Creek.

24 We're still looking towards Superfund or Iron Mountain
25 Mine to solve the problem. However, we feel right now that

1 Superfund has the capital.

2 We hear of the private capital. There are court
3 records that they testify that they have no money. So the
4 capital has been to be there and it has to be there soon or
5 we're going to lose this money that Superfund has and we're
6 going to lose the solution to this problem that will benefit
7 the state.

8 MR. CLIFFORD: It's getting late.

9 MR. McLEAN: I think -- Dan McLean -- I think we
10 should be aloud to respond to that.

11 MR. CLIFFORD: If you can keep it real brief,
12 please.

13 Could we have one reponse?

14 MR. McLEAN: Should I respond?

15 MR. CLIFFORD: Could we have one response from
16 Iron Mountain Mine, please.

17 MR. McLEAN: Let me point out a real problem that
18 we face in trying to resolve the problem here. Jim has
19 alluded to the fact that we don't have the money to do the job
20 that we're proposing.

21 We proposed, to the Water Board and to EPA, the general
22 outline of this thing over two years ago. And we were brushed
23 off and told to come back later and never contacted again
24 until we accidentally found out that this program was going on
25 about six months ago.

1 In the meantime, we endeavored to get that project
2 funded, but came up against a stone wall of having this
3 \$500,000 fine -- first, it was \$16 million. And at the very
4 time we were trying to get this proposal underway, this \$16
5 million fine came along, which completely closed off any
6 chances of anyone in their right mind putting up finances for
7 the Iron Mountain Mine project.

8 Now, we tried to work with the Water Board and we have
9 tried recently to work with EPA to get them to give us some
10 clear-cut word that the cloud that they have placed over Iron
11 Mountain Mine as one of the worst polluted sites in the
12 country --

13 And the Water Board has made statements to newspapers
14 all over the area that this is in the same category as
15 Strangefellow Dump, which is an outright fabrication.

16 Who in their right mind is going to put money into an
17 operation when the public agencies are condemning it in those
18 terms?

19 So our problem has been the attitude and the
20 non-cooperation that we have been subject to on the part of
21 agencies. And it's one of the problems we're trying to work
22 out now.

23 And we presented a reasonable -- a solution to the
24 problem. And we're hoping that we can work with the agencies
25 to give them what they want.

1 And yet, it's a real struggle to get these people to
2 really cooperate so that we can push this thing along at
3 rapidly as possible.

4 MR. CLIFFORD: Thank you, Mr. McLean.

5 Okay. If there are no other comments, I'd like to
6 encourage everyone to submit written comments to us. And you
7 can submit those comments to Mr. Tom Mix.

8 The address is in the fact sheet -- I believe it's in
9 the fact sheet.

10 Is that right, Tim?

11 MR. VENDLINSKI: Yes.

12 MR. CLIFFORD: So please submit those comments to
13 Mr. Mix at that address.

14 I'd like to thank all of you for attending tonight, and
15 many of you for participating tonight. And with that, I won't
16 keep you any longer.

17 Thank you very much.

18 (Whereupon the meeting was adjourned at 10:47 p.m.)

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CERTIFICATE OF REPORTER

STATE OF CALIFORNIA)
COUNTY OF SHASTA) ss

I, CLIFFORD M. FISHER, Notary Public of the State of California, in and for the County of Shasta, do hereby certify:

That the foregoing transcript of the proceedings constitutes a full and complete transcript of the proceedings had at the time and place therein stated, that such proceedings were taken down in stenographic shorthand by me, CLIFFORD M. FISHER, a Certified Shorthand Reporter, and thereafter reduced to typewriting under my direction.

I further certify that I am not of counsel or attorney for any of the parties hereto or in any way interested in the event of this cause, and that I am not related to any of the parties hereto.

WITNESS MY HAND this 26th day of August,
19 85.



CLIFFORD M. FISHER, C.S.R.
My Commission Expires:
March 24, 1989.

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