GEYSERS POWER COMPANY, LLC
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Middletown, CA 95461
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DOCKET
81-AFC-1C
DATE APR 17 2008
RECD. APR 21 2008

GWQ-08-094

April 17, 2008

Ms. Donna Stone
Compliance Project Manager
Oxy Geothermal Plant No. 1
Docket No. 81-AFC-1
California Energy Commission
1516 Ninth Street, MS 2000
Sacramento, CA 95814-5512

Re: Petition to Amend Condition Biological Resources 5-4 for the Calistoga Power Plant (Formerly known as the "Occidental (OXY) Geothermal Power Plant No. 1), Docket 81-AFC-1
Submitted by Geysers Power Company, LLC

Pursuant to Section 1769 of the California Energy Commission (CEC) Siting Regulations, Geysers Power Company, LLC ("GPC"), hereby submits the attached Petition to amend Condition Biological Resources 5-4 for the Calistoga Power Plant (formerly known as the "Occidental (OXY) Geothermal Power Plant No. 1), regarding boron drift monitoring. GPC would like to withdraw the Petition submitted on March 13, 2008, letter # GWQ-08-065 and replace it with the attached Petition.

As discussed in the attached Petition, twenty years worth of data confirm that boron drift sampling is no longer necessary and should not be required. Specifically, in the Petition, GPC requests that the Condition be amended to give the Compliance Project Manager the discretion to confirm in writing that further boron drift testing is not required.

GPC also seeks to clarify questions related to the name of the facility now known as the Calistoga Power Plant. As part of that clarification, GPC presents a brief summary of both the ownership and the name of the facility as Attachment 1. Since GPC is simply clarifying the name of the facility and since there is no change of ownership associated with the Petition, this information is presented for your information and to clarify the name of the facility in the Commission's Docket.

Enclosed are five copies of GPC's Petition. Please contact me at (707) 431-6097 if you require any additional information in support of the request.

Sincerely,

Jody Spooner
Senior Compliance Specialist

PETITION TO AMEND CONDITION BIOLOGICAL RESOURCES 5-4 FOR THE CALISTOGA POWER PLANT

As required by Section 1769 of the CEC Siting Regulations, GPC hereby submits the following discussion to amend Condition Biological Resources 5-4.

Pursuant to Section 1769 (a)(1)(A) and (B), a description of the proposed modifications, including new language for affected conditions and the necessity for the modifications is required.

GPC is requesting approval of the modification so that the 5-year boron monitoring survey can be modified in Condition Biological Resources 5-4. The requirement for monitoring was initiated to assess the impacts of geothermal operations on local vegetation. A prime concern was the impact of boron on vegetation. A monitoring program which includes a 5-year-interval program of obtaining color infrared photographs of the Calistoga power plant site; and ground foliar sampling at the study plots for boron content was initiated.

Twenty years of monitoring for boron impacts on the Calistoga Power Plant indicate a decrease in the average boron concentration levels in leaves of surrounding plants. Additional monitoring and analysis is unlikely to add additional valuable information to studies of the impact of boron on vegetation.

Mr. Douglas Nix of LandWatch, Incorporated has conducted the boron monitoring personally, for the Calistoga Power Plant since 1985. His last monitoring survey was in 2003. Mr. Nix of LandWatch recommends termination of boron monitoring in his 2003 report. He states that new information gathered over the past 20 years of monitoring, based on laboratory analysis of plant leaf tissues, onsite visual observations and through color infrared aerial imagery, indicates no significant impact of power plant drift on the surrounding vegetation. See Attachment 2 for a copy of the report entitled "2003 Boron Drift Monitoring Survey for the Calpine Geothermal Power Plant".

Based on these twenty years of studies and the professional opinions set forth in Attachment 2, GPC recommends that Biological Resources Condition 5-4 be modified as follows:

5-4.; ~~Occidental~~ The project owner shall monitor drift effects on the vegetation surrounding the power plant. Monitoring shall be conducted for one year prior to operation, annually for the first three years of operation, and then at five-year intervals ~~for the life of the power plant. Monitoring shall include large-scale (not smaller than 1:3000) false color infrared photographs (one stereo pair), taken in June, coupled with ground sampling at permanent study plots. Ground sampling will include examination by a qualified biologist for visible foliar injury and collection of foliar samples which will be analyzed for boron content at a qualified laboratory~~ or until the CPM confirms in writing

that boron drift is not having a significant on the vegetation surrounding the power plant and that the project owner is no longer required to conduct further monitoring.

Verification: ~~Occidental~~ The project owner shall submit ~~annual~~ reports to the CEC in those years in which the monitoring takes place. These reports shall include copies of all laboratory analyses, field survey work, and a stereo pair (full color copy) of aerial photographs of the leasehold.

Pursuant to Section 1769 (a)(1)(C), a discussion is required on if the modification is based on information that was known by the petitioner during the certification proceeding, and an explanation of why the issue was not raised at that time.

The changes being requested in this Petition are based on new information that was learned as a result of operating experience gained at the facility and was not known at the time of certification.

Pursuant to Section 1769(a)(1)(D), a discussion is required on whether the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, and explanation of why the change should be permitted.

The proposed changes in this Petition are based on information learned after the completion of the certification process during the commissioning and operation phase of the project. Given that the revisions are based on twenty years of data, the proposed revisions do not undermine the assumptions, rationale, findings or other bases of the final decision.

Pursuant to Section 1769(a)(1)(E), an analysis of the impacts the modifications may have on the environment and proposed measures to mitigate any significant adverse impacts is required.

Given that the revisions are based on field data gathered over twenty years, the data confirms that proposed changes to the condition of certification will not result in any significant adverse environmental impact.

Pursuant to Section 1769(a)(1)(F), a discussion of the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards is required.

The proposed changes to Biological Resources Condition of Certification 5-4 will not alter the assumptions or conclusions reached in the CEC's Final Decision. The third-party surveys have indicated no impact on the environment. Modification of the condition requiring the boron study will have no impact on the facility's ability to comply with applicable laws, ordinances, regulations and standards (LORS) as the facility is in compliance with all current LORS.

Pursuant to Section 1769 (a)(1) (G), a discussion of how the modifications affect the public is required.

Because the modification will not result in any significant, unmitigated environmental impacts and because the project will remain in compliance with applicable laws, ordinances, regulations, and standards, the proposed modification will not adversely affect the public.

Pursuant to Section 1769(a)(1)(H), a list of property owners potentially affected by the modification is required.

A list of contiguous property owners is contained in Attachment 3. GPC is the current surface owner of the Calistoga Power Plant site. To the southwest of the property, the land is USA surface and minerals.

Pursuant to Section 1769(a)(1)(I), a discussion of the potential effect on nearby property owners, the public and the parties in the application proceedings is required.

This Amendment will not result in any changes to the potential effects on nearby property owners, the public and parties in the application proceeding from those described in the Commission's approval of the project. Accordingly, the proposed amendments will have no impact on property owners, the public, or any other parties.

ATTACHMENT 1

CLARIFICATION OF THE RECORD
PROJECT NAME AND SUMMARY OF OWNERSHIP HISTORY

Geysers Power Company, LLC ("GPC"), a wholly owned subsidiary of Calpine Corporation, is the owner of the project. The project's name is the "Calistoga Power Plant." Again, there has been no "change of ownership" and none is requested by this Petition. Further, changing the name of the facility only does not require a petition under Section 1769 of the Commission's Regulations. Accordingly, the following chronology is intended to clarify history of the ownership and name history of the project, but there is no need for the Commission to take any action on ownership or name related issues.

On February 1, 1982, the California Energy Commission (CEC) issued a License to Occidental Geothermal Inc. to construct and operate the OXY Geothermal Plant No. 1 Project. The plant began operation commercially on April 10, 1984.

Between 1982 and 1999, Occidental Geothermal underwent several ownership transfers and name changes within corporate entities. The power plant name was changed internally by several of the new owners, or new corporate entities. The history of ownership follows:

In November 1984, Occidental Geothermal, Inc stock was purchased by Santa Fe International Corporation and notices were requested to be sent to Santa Fe Geothermal. Inc. The power plant then became known as Santa Fe Geothermal Plant No. 1.

In April 1997, Santa Fe International Corporation sold Santa Fe Geothermal, Inc. to ESI (a division of FPL that was subsequently renamed FPL Energy). ESI renamed Santa Fe Geothermal, Inc. – Silverado Geothermal Resources, Inc.

In 1997, Silverado Geothermal Resources, Inc. immediately sold the power plant to Calistoga Geothermal Partners, LP.

In 1999, Calpine bought 100% of the stock in Calistoga Geothermal Partners, LP and Silverado Geothermal Resources, Inc.

In October 1999, in accordance with Section 1569 (b) of Title 20 of the California Code of Regulations, Calistoga Geothermal Partners, LP submitted a Petition to Transfer Ownership of the Calistoga Geothermal Power Plant from Calistoga Geothermal Partners, LP to Geysers Power Company, LLC (GPC) both indirect wholly owned subsidiaries of Calpine Corporation. The Petition was granted.

In the early 2000s, the Calistoga Power Plant also became known as "Calpine Geothermal Power Plant 19". This is how the plant is identified in the 2003 Boron Drift Monitoring Survey, which is Attachment 2 to the Petition. GPC currently identifies the

power plant as the "Calistoga Power Plant" and it is referred to in this Petition as the "Calistoga Power Plant".

Since GPC is simply clarifying the name of the facility and sicne there is no change of ownership associated with the Petition, this information is presented for your information and to clarify the name of the facility in the Commission's Docket. Accordingly, GPC, as owner of the project and holder of the Commission's certificate, respectfully requests that the Commission update its files to reflect the project name of "Calistoga Power Plant".

ATTACHMENT 2

2003 Boron Drift Monitoring Survey for the Calpine Geothermal Power Plant

ATTACHMENT 3

List of Property Owners

Ernest R. Angeli	28905 River Road	Cloverdale, Ca 95425
V.K. Leary	P.O. Box 811	Cobb, Ca 95426

LANDWATCH INCORPORATED

Environmental Monitoring & Management

2003 BORON DRIFT MONITORING SUMMARY FOR THE CALPINE GEOTHERMAL POWER PLANT #19

PREPARED FOR:

CALPINE CORPORATION
10350 SOCRATES MINE ROAD
MIDDLETOWN, CA 95461
(707) 431-6000

PREPARED BY:

DOUGLAS E. NIX
LANDWATCH, INCORPORATED
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NOVEMBER 17, 2003

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CALPINE CORPORATION
BORON DRIFT MONITORING PROGRAM, 2003

SUMMARY

Vegetation surrounding Calpine Corporation's Geothermal Power Plant (formerly Santa Fe Geothermal #1) was sampled from permanent transects that were established in September, 1985. These locations are field identified and the sampled woody plants are individually tagged for identical resampling in future years. Sampling the same plants is important due to the extreme variability in soil conditions within the The Geysers area. The 1983, 1984, 1985, 1986, 1992, and 1996 sample data show high variability in the concentrations of boron within the sampled plants. The 2003 sample results show similar variability, only with a decrease of 15.07 percent in th mean boron concentration. Outside (non-Calpine Corporation power plant) factors such as Calpine #3 Power Plant, well bore releases, orographic influences, and overall weather and wind patterns will influence these results.

No pattern of concentrations, like those noted by PG&E around its Units 5 & 6 (Malloch, et al., 1979), are discernable within this study.

INTRODUCTION

BACKGROUND

Condition 5-4 set forth by the California Energy Commission (CEC) requires a detailed monitoring program to assess the impacts of geothermal operations upon the local vegetation. Of prime concern are the impacts of boron on vegetation. Although boron is a necessary trace element, in high concentrations (>500 ppm) it can be deleterious or toxic to vegetation. This report summarizes the 2003 sampling program which compliments the already completed 1983, 1984, 1985, 1986, 1992, and 1996 work.

Boron is known to accumulate in the foliage of plants. Resulting accumulation may be either from root uptake, foliar deposition and subsequent absorption, or both. Species tolerance is highly variable and is influenced by drought tolerance and moisture levels within the surrounding soils.

OBJECTIVES

The objectives of this investigation are to provide compliance documentation for the CEC and to assess the impact (if any) of Calpine Corporation's geothermal power plant operations upon the surrounding vegetation.

METHODOLOGY

Field locations of transects were located in the same area (see Figure 1) as sampled for the 1983 through 1996 data collections. For consistency of data collection, and for inspection by Calpine Corporation personnel and CEC staff, transect ends were permanently marked and sampled vegetation were tagged with horticultural tags. Samples were collected from a total of 19 plant species which were labeled, bagged and submitted for laboratory analysis. Standard laboratory analysis using inductive coupled plasma (ICP) techniques (Method 6010) were used by MDS Harris Laboratories of Lincoln, Nebraska.

In addition to field sampling, false color infrared aerial photographs were taken on June 17, 2003. The photos were taken at a scale of 1" = 250' in stereo coverage. These photos were evaluated to identify any existing or developing problems that may not be visible from ground surveys.

RESULTS

The laboratory analysis shows an overall decrease of 13.74 ppm in the average boron concentration compared to the 1996 results and a 32.15 ppm decrease compared to the 1985 results. A random scattering of foliar boron concentration is clearly evident in the data shown in Table 1. Table 2 compares the percent change between 1996 and 2003 boron concentration levels. The average boron concentration decreased 15.07 percent between 2003 and 1996 monitoring periods. Table 3 summarizes the visual assessment of leaf condition by species and transect. There was a .06 percent decrease in observed leaf damage between 1996 and 2003. As before, the majority of the damage was the result of insects and not boron damage. Table 4 provides an overall summary of the 2003 sampling results with high, low, and average values for boron concentration and leaf damage percentages. Table 5 summarizes the distance to cooling tower/boron concentration relationships. Transects 6 and 5 are the most distant from the cooling towers and had the highest average boron concentration. This is a complete reversal from the 1996 monitoring period when transects 2 and 3 (closest to the cooling towers) had the highest boron concentrations. No clear pattern between the distance to the cooling towers and the boron concentrations was observed. Review of the infrared aerial photographs did not reveal any problem areas.

CONCLUSIONS

The 2003 data reconfirms the previous years data, namely that no distinct pattern is evident regarding boron concentration in the sampled vegetation. Localized impacts (i.e. venting, drilling, and well blow-out activities) may produce limited impacts. However, no trends in the laboratory analysis or the visual summary can be seen. Boron concentration values tend to increase and decrease by species and transect between monitoring periods. This variation may be influenced by the weather patterns between the monitoring periods. The end of California drought and the above normal to normal rainfall between the last monitoring periods may account for some of the overall decrease in boron concentrations through leaching of soluble boron in the soil.

RECOMMENDATION

Tissue boron levels of the vegetation surrounding this geothermal power plant have been monitored for the past 20 years. During this time there has been no significant impact on the vegetation surrounding the power plant. This has been confirmed through laboratory analysis of the plant leaf tissues, onsite visual observations, and through infrared aerial imagery. Given the non-impacted of this power plant's steam emissions on the surrounding vegetation, it is the consultants recommendation that the boron monitoring of this site be concluded with this 2003 report.

TABLE 1.
SUMMARY OF LEAF BORON CONCENTRATIONS
CALPINE GEOTHERMAL DRIFT MONITORING PROGRAM 2003

SPECIES	BORON CONCENTRATION (mg/kg or ppm) BY TRANSECT										NO. OF OCCURRENCES	AVG. BORON CONCENTRATION BY SPECIES
	1	2	3	4	5	6	7	8	9	10		
Adenostoma fasciculatum (chamise)				33			35				2	34.00
Arbutus menziesii (madrone)								34			1	34.00
Arctostaphylos (manzanita)	36	44	35	24	86	76	31	49			8	47.63
Ceanothus cuneatus (buck bush)		56					38				2	47.00
Ceanothus integerrimus (deer bush)				50							1	50.00
Ceanothus jepsonii (musk bush)	27				29						2	28.00
Cerocarpus betuloides (mountain mahogany)		73	46				35				3	51.33
Pinus attenuata (knob cone pine)	47				27	41		30			4	36.25
Pinus sabiniana (digger pine)	29										1	29.00
Polystichum munitum (sword fern)								30			1	30.00
Pseudotsuga menziesii (Douglas fir)	71			33							2	52.00
Quercus chrysolepis (canyon live oak)		229	85	44		152	43	47			6	100.00
Quercus durata (leather oak)	37				45	85					3	55.67
Quercus kelloggii (black oak)								55			1	55.00
Quercus wislizenii (interior live oak)		74		35			33				3	47.33
Rhamnus californica (coffeeberry)	58				43	118					3	73.00
Trifolium hirtum (rose clover)									27	78	2	52.50
Umbellularia californica (bay)		83			254	161	34	54			5	117.20
NO. OF SPECIES PER TRANSECT	**7**	**6**	**3**	**6**	**6**	**6**	**7**	**7**	**1**	**1**	**OVERALL AVG. BORON CONC. BY TRANSECT**	
AVG. BORON CONC. BY TRANSECT	**43.57**	**93.17**	**55.33**	**36.50**	**80.67**	**105.50**	**35.57**	**42.71**	**27.00**	**78.00**		**59.80**

TABLE 2
COMPARISON OF PERCENT CHANGE IN BORON CONCENTRATION, 1996-2003
CALPINE GEOTHERMAL DRIFT MONITORING PROGRAM 2003

		PERCENT CHANGE IN BORON CONCENTRATION BETWEEN 1996 AND 2003																			
SPECIES	1996	2003	Tran. 1	1996	2003	Tran. 2	1996	2003	Tran 3.	1996	2003	Tran. 4	1996	2003	Tran. 5	1996	2003	Tran. 6	1996	2003	Tran. 7
Arctostaphylos (manzanita)	86	36.00	-58.14%	14.00	44.00	214.29%	300.00	35.00	-88.33%	80.00	24.00	-70.00%	21.00	86.00	309.52%	84.00	76.00	-9.52%	31.00	31.00	0.00%
Ceanothus jepsonii (musk bush)	88	27.00	-69.32%										38.00	29.00	-23.68%						
Pseudotsuga menziesii (Douglas fir)	77	71.00	-7.79%							30.00	33.00	10.00%									
Pinus sabiniana (digger pine)	65	29.00	-55.38%																		
Pinus attenuata (knob cone pine)	23	47.00	104.35%										86.00	27.00	-68.60%	78.00	41.00	-47.44%			
Quercus durata (leather oak)	83	37.00	-55.42%										71.00	45.00	-36.62%	140.00	85.00	-39.29%			
Rhamnus californica (coffeeberry)	24	58.00	141.67%										77.00	43.00	-44.16%	40.00	118.00	195.00%			
Ceanothus cuneatus (buck bush)				75.00	56.00	-25.33%													48.00	38.00	-20.83%
Cerocarpus betuloides (mountain mahogany)				80.00	73.00	-8.75%	64.00	46.00	-28.13%										26.00	35.00	34.62%
Quercus chrysolepis (canyon live oak)				57.00	229.00	301.75%	27.00	85.00	214.81%	46.00	44.00	-4.35%				140.00	152.00	8.57%	58.00	43.00	-25.86%
Quercus wislizenii (interior live oak)				300.00	74.00	-75.33%				25.00	35.00	40.00%							35.00	33.00	-5.71%
Adenostoma fasciculatum (chamise)										18.00	33.00	83.33%							16.00	35.00	118.75%
Umbellularia californica (bay)				540.00	83.00	-84.63%							87.00	254.00	191.95%	120.00	161.00	34.17%	30.00	34.00	13.33%
Ceanothus integerrimus (deer bush)										54.00	50.00	-7.41%									
Arbutus menziesii (madrone)																					
Polystichum munitum (sword fern)																					
Quercus kelloggii (black oak)																					
Trifolium hirtum (rose clover)																					
AVG. BORON CONCENTRATION BY TRANSECT	**63.714**	**43.57**		**177.67**	**93.17**		**130.33**	**55.33**		**42.17**	**36.50**		**63.33**	**80.67**		**100.33**	**105.50**		**34.86**	**35.57**	
AVG. % CHANGE BY TRANSECT			**-31.61%**			**-47.56%**			**-57.54%**			**-13.44%**			**27.37%**			**5.15%**			**2.05%**

TABLE 3.
SUMMARY OF VISUAL ASSESSMENT SURVEY FINDINGS
CALPINE GEOTHERMAL DRIFT MONITORING PROGRAM 2003

SPECIES	VISUAL ASSESSMENT OF LEAF CONDITION BY TRANSECT (% DAMAGE)										NO. OF OCCURRENCES	DAMAGE BY SPECIES
	1	2	3	4	5	6	7	8	9	10		
Arctostaphylos (manzanita)	2	3.28	13.04	14.96	6.24	7.3	9.58	6.24			8	7.83
Ceanothus jepsonii (musk bush)	4.92				1.38						2	3.15
Pseudotsuga menziesii (Douglas fir)	1.84			3.66							2	2.75
Pinus sabiniana (digger pine)	8.2										1	8.20
Pinus attenuata (knob cone pine)	20.34				7.98	7.48		6.12			4	10.48
Quercus durata (leather oak)	6.98				4.38	2.64					3	4.67
Rhamnus californica (coffeeberry)	2.64				3.02	4.84					3	3.50
Ceanothus cuneatus (buck bush)		2.2					1.28				2	1.74
Cerocarpus betuloides (mountain mahogany)		5	8.26				3.92				3	5.73
Quercus chrysolepis (canyon live oak)		8.52	2.4	4.96		6.82	3.78	5.66			6	5.36
Quercus wislizenii (interior live oak)		6.9		0.72			2.1				3	3.24
Adenostoma fasciculaturm (chamise)				0			0				2	0.00
Umbellularia californica (bay)		10.28			3.2	3.96	2.6	3.34			5	4.68
Ceanothus integerrimus (deer bush)				3.66							1	3.66
Arbutus menziesii (madrone)								1.7			1	1.70
Polystichum munitum (sword fern)								0.84			1	0.84
Quercus kelloggii (black oak)								5.24			1	5.24
Trifolium hirtum (rose clover)									0	0	2	0.00
NO. OF SPECIES / TRANSECT	**7**	**6**	**3**	**6**	**6**	**6**	**7**	**7**	**1**	**1**	**OVERALL % DAMAGE BY TRANSECT**	
AVG. PERCENTAGE OF DAMAGE BY TRANSECT	**6.70**	**6.03**	**7.90**	**4.66**	**4.37**	**5.51**	**3.32**	**4.16**	**0.00**	**0.00**		**4.27**

TABLE 4.
VISUAL ANALYSIS AND BORON CONCENTRATIONS BY SPECIES
CALPINE GEOTHERMAL DRIFT MONITORING PROGRAM 2003

	BORON CONCENTRATION			VISUAL DAMAGE			
SPECIES	HIGH	LOW	AVG.	HIGH	LOW	AVG.	NUMBER OF OCCURENCES
Adenostoma fasciculatum (chamise)	35	33	34	0	0	0	2
Arbutus menziesii (madrone)	34	34	34	1.7	1.7	1.7	1
Arctostaphylos (manzanita)	86	24	47.63	14.96	2	7.83	8
Ceanothus cuneatus (buck bush)	56	38	47	2.2	1.28	1.74	2
Ceanothus integerrimus (deer bush)	50	50	50	3.66	3.66	3.66	1
Ceanothus jepsonii (musk bush)	29	27	28	4.92	1.38	3.15	2
Cerocarpus betuloides (mountain mahogany)	73	35	51.33	8.26	3.92	5.73	3
Pinus attenuata (knob cone pine)	47	27	36.25	20.34	6.12	10.48	4
Pinus sabiniana (digger pine)	29	29	29	8.2	8.2	8.2	1
Polystichum munitum (sword fern)	30	30	30	0.84	0.84	0.84	1
Pseudotsuga menziesii (Douglas fir)	71	33	52	3.66	1.84	2.75	2
Quercus chrysolepis (canyon live oak)	229	43	100	8.52	2.4	5.36	6
Quercus durata (leather oak)	85	37	55.67	6.98	2.64	4.67	3
Quercus kelloggii (black oak)	55	55	55	5.24	5.24	5.24	1
Quercus wislizenii (interior live oak)	74	33	47.33	6.9	0.72	3.24	3
Rhamnus californica (coffeeberry)	118	43	73	4.84	2.64	3.5	3
Trifolium hirtum (rose clover)	78	27	52.5	0	0	0	2
Umbellularia californica (bay)	161	34	117.2	10.28	2.6	4.68	5
TOTAL NUMBER OF SAMPLES							**50**

TABLE 5.
TISSUE BORON RANKING BY STATION, DISTANCE AND DIRECTION
CALPINE GEOTHERMAL DRIFT MONITORING PROGRAM 2003

	DIRECTION FROM COOLING TOWERS			
CONC. BY TRANSECT	NORTH	EAST	SOUTH	WEST
6		1450/105.5		
2		400/36.5		
5		1300/80.67		
10	790/78			
3	*330/55.33			
1		990/43.57		
8	650/42.71			
4				710/36.5
7				840/35.57
9				470/27

* 330 feet from cooling towers/55.33 ppm average boron concentration for transect 3

Appendix A
Laboratory Analysis
Data Sheets

CMDS Hartle

REPORT OF ANALYSIS

Sample Of: Plant

Submitted By:

Ralph Osterling Consulting
1650 Borel Place

San Mateo, CA 94402

Submitted For:

Calpine

Middleton, CA

Date Received	Date Reported	Samples Will Be Stored Until	Laboratory No.
22-Sep-03	23-Sep-03		614294-614322

REPORT OF ANALYTICAL RESULTS

Client Sample Identification	Analysis	Result
T1-1	Boron	36 PPM
T1-2	Boron	27 PPM
T1-3	Boron	71 PPM
T1-4	Boron	29 PPM
T1-5	Boron	47 PPM
T1-6	Boron	37 PPM
T1-7	Boron	58 PPM
T2-1	Boron	44 PPM
T2-2	Boron	56 PPM
T2-3	Boron	73 PPM
T2-4	Boron	229 PPM
T2-5	Boron	74 PPM
T2-6	Boron	83 PPM
T3-1	Boron	35 PPM
T3-2	Boron	46 PPM
T3-3	Boron	85 PPM
T4-1	Boron	24 PPM
T4-2	Boron	33 PPM
T4-3	Boron	44 PPM
T4-4	Boron	35 PPM
T4-5	Boron	33 PPM
T4-6	Boron	50 PPM
T5-1	Boron	36 PPM
T5-2	Boron	29 PPM
T5-3	Boron	27 PPM
T5-4	Boron	45 PPM
T5-5	Boron	43 PPM
T5-6	Boron	254 PPM

MDS Harris

REPORT OF ANALYSIS

Sample Of	Plant

Submitted By	Submitted For
Ralph Osterling Consulting 1850 Borel Place San Mateo, CA 94402	Calpine Middleton, CA

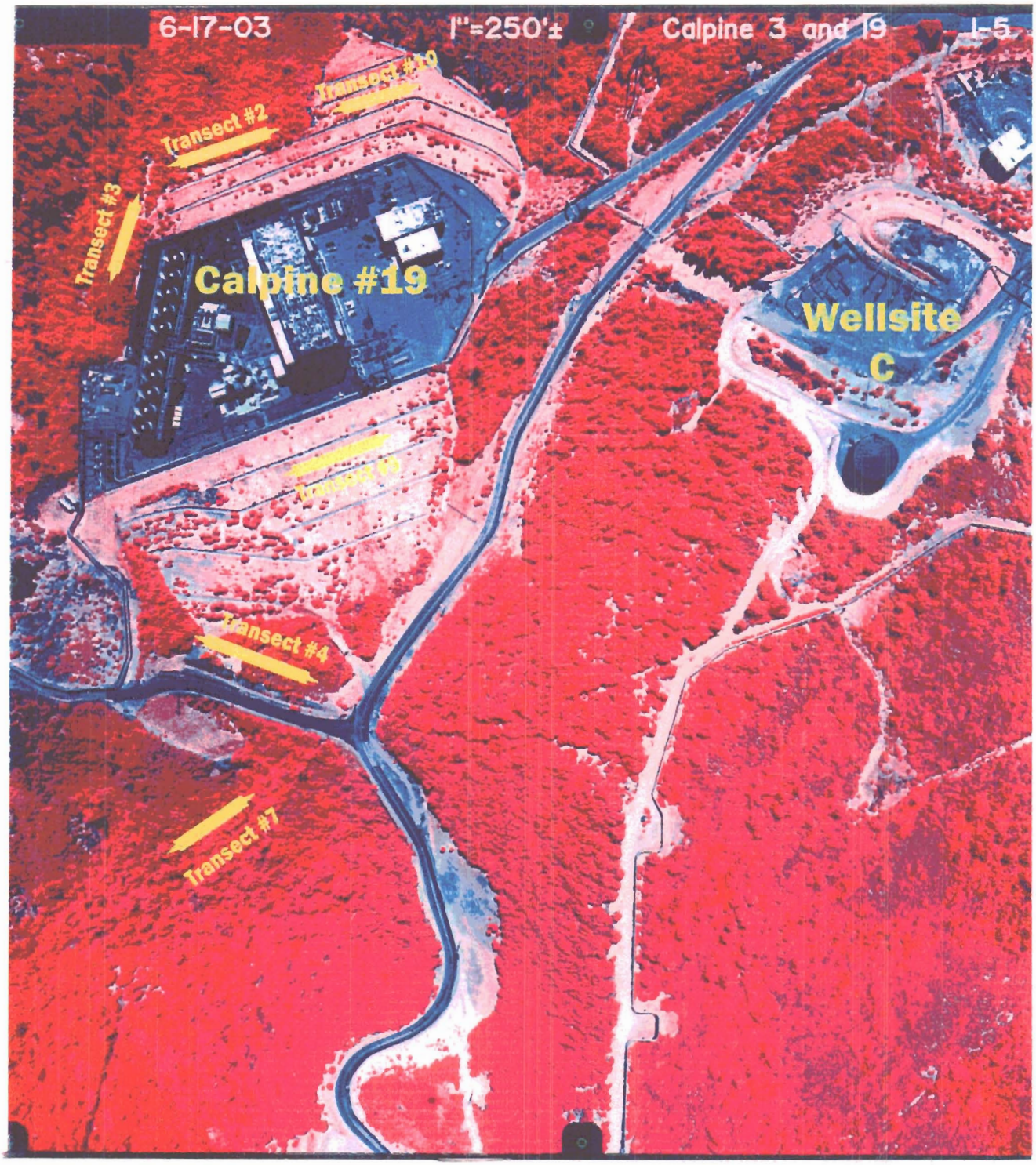
Date Received	Date Reported	Samples Will Be Stored Until	Laboratory No.
22-Sep-00	20-Sep-00		614323-614349

REPORT OF ANALYTICAL RESULTS

Client Sample Identification	Analysis	Result
T6-1	Boron	76 PPM
T6-2	Boron	41 PPM
T6-3	Boron	85 PPM
T6-4	Boron	118 PPM
T6-5	Boron	152 PPM
T6-6	Boron	161 PPM
T7-1	Boron	31 PPM
T7-2	Boron	38 PPM
T7-3	Boron	35 PPM
T7-4	Boron	43 PPM
T7-5	Boron	33 PPM
T7-6	Boron	35 PPM
T7-7	Boron	34 PPM
T8-1	Boron	49 PPM
T8-2	Boron	30 PPM
T8-3	Boron	47 PPM
T8-4	Boron	54 PPM
T8-5	Boron	34 PPM
T8-6	Boron	30 PPM
T8-7	Boron	55 PPM
T9-1	Boron	46 PPM
T9-3	Boron	30 PPM
T9-2	Boron	27 PPM
T10-1	Boron	58 PPM
T10-2	Boron	78 PPM
T10-3	Boron	45 PPM

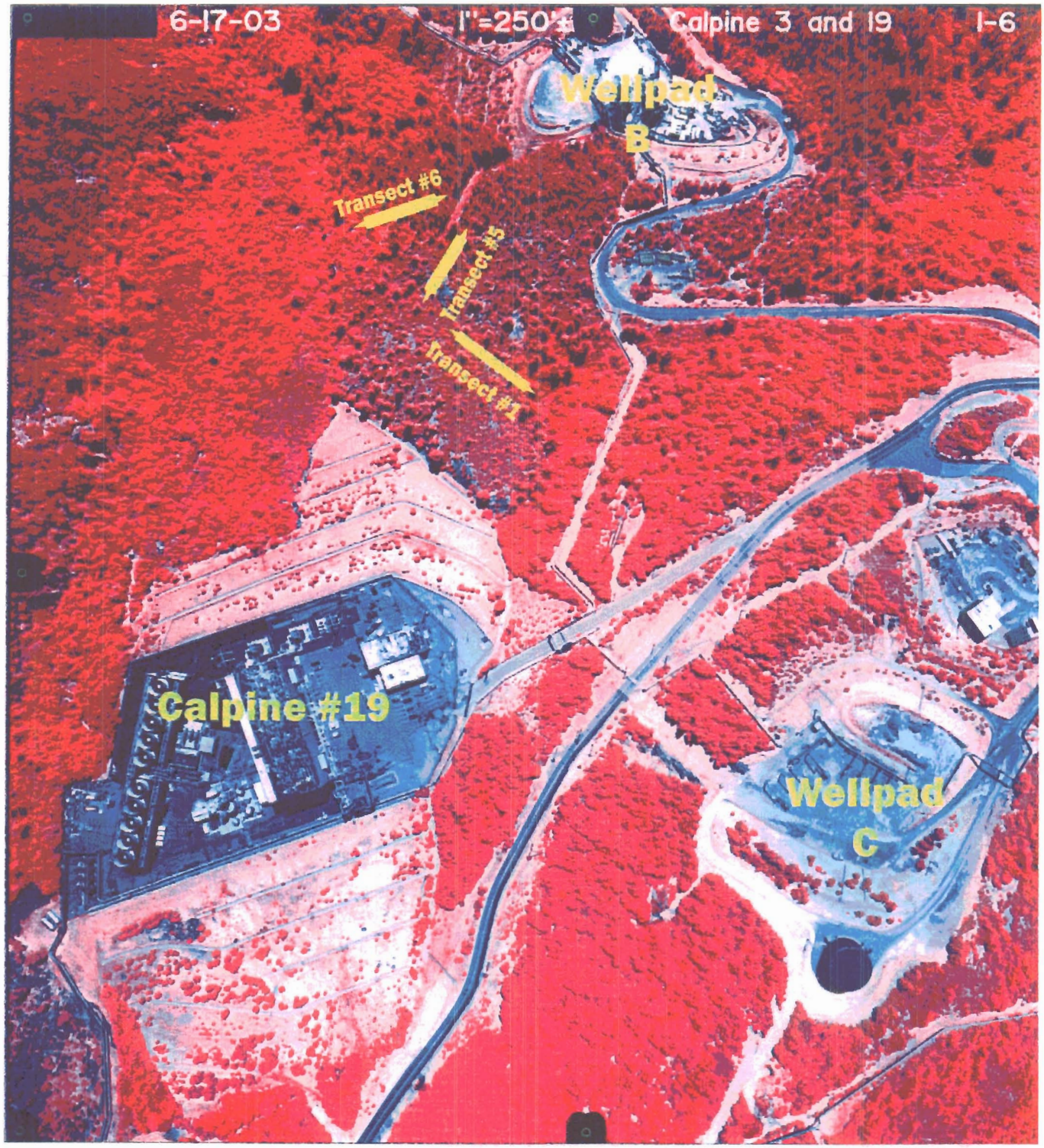
Appendix B
Color Infrared Aerial Photos
and
Transect Locations

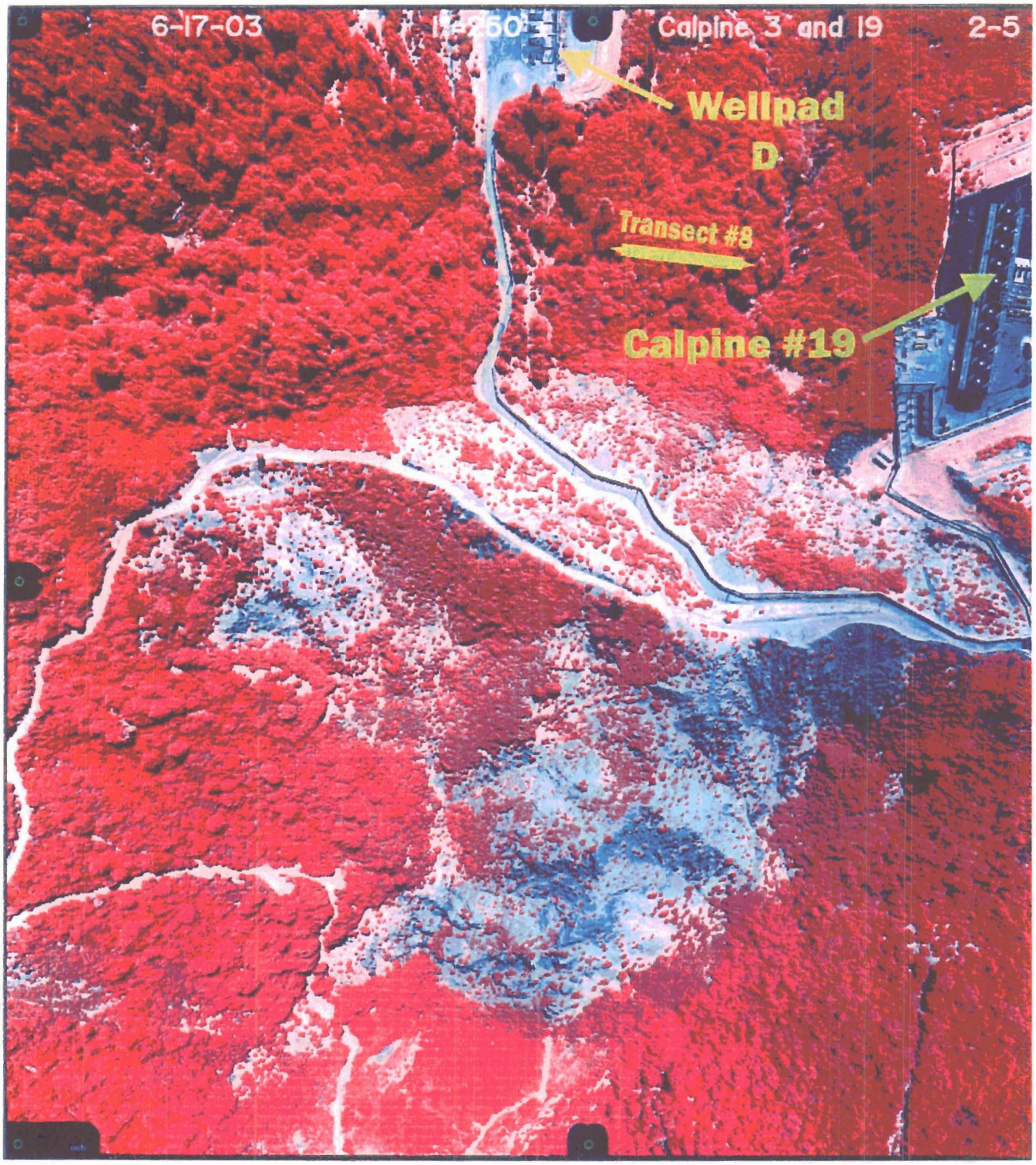
Calpine Geothermal Powerplant
#19
2003 Boron Drift Monitoring Study
Transect Locations



LandWatch, Incorporated

Calpine Geothermal Powerplant
#19
2003 Boron Drift Monitoring Study
Transect Locations



LandWatch, Incorporated

CALPINE GEOTHERMAL POWERPLANT
#19
2003 BORON DRIFT MONITORING STUDY
TRANSECT LOCATIONS