MTC

Cyto Culture
INTERNATIONAL INC.
ENVIRONMENTAL BIOTECHNOLOGY

June 15, 1989

Mr. Michael Chee
Toxics Clean-Up
California Regional Water Quality Control Board
San Francisco Bay Region
1111 Jackson
Room 6040
Oakland, CA 94607

Dear Mr. Chee:

Please find enclosed a copy of the operating report for May at the former P.I.E. truck terminal in Emeryville. If you have any questions or comments please call.

Sincerely,

John P. Humphries
Business Development for
Randall von Wedel, Ph. D.
Project Manager

JUN 16 1989

PIE
Nationwide Property
5500 Eastshore Hwy

CytoCulture
INTERNATIONAL
INC
ENVIRONMENTAL BIOTECHNOLOGY

89 NOV 27 AM 11:47

June 13, 1989

Mr. William Meckel
Source Control Division
EAST BAY MUNICIPAL UTILITY DISTRICT
Mail Stop 59 P.O. Box 24055
Oakland, CA 94623

RE: Wastewater Discharge Permit (Groundwater Treatment)
EBMUD Account No. 001-00002
Second monthly report of treatment and discharge operations for MAY 1989

CytoCulture/Sybron Chemicals are herein reporting on the results for the ~~second~~ third month of continuous biological treatment of diesel-contaminated groundwater and discharge of the treated water into an EBMUD interceptor at the former P.I.E. Nationwide truck terminal in Emeryville. Laboratory analytical results are enclosed along with our Daily Facility Log Sheets.

SUMMARY OF EVENTS AND OPERATIONS IN MAY

Operating Conditions at Beginning of Month

At the end of April, both bioreactor systems were in continuous operation processing diesel-contaminated groundwater at a rate of 2.5 to 3 gpm (3,400 to 4,000 gpd). Since the system start up on March 2, approximately 145,000 gallons of contaminated groundwater had been processed during the start-up, pilot-scale, and subsequent full scale operation of our treatment system.

Influent total petroleum hydrocarbon levels in April had been in the range of 0 to 2.2 ppm; BTXE levels were variable, ranging from zero to 630 ppb for benzene, zero to 16 ppb for toluene, zero to 4 ppb for ethyl benzene and zero to 12 ppb for xylenes. All treated water effluent discharges registered as non-detectable for all of these constituents; a healthy bacterial floc settled out in about one hour to leave a clear, transparent and odorless supernatant. Samples of this treated water are available for inspection.

On May 1, the south extraction trench flow rate was running consistently at 2.5-3.0 gpm through both bioreactor systems. An oil skimmer had been installed in the east well of the south extraction trench, but no free product was observed until May 3. ~~An~~ effluent sample (E-34) was taken on this day for routine analysis.

1208 Fourth Avenue San Francisco CA 94122 415 564 1506
MCI Mail ID 308 4597 Telex (via WUI) 6503084597 FAX 415 564 1086

Under these conditions our pumping rate still exceeds the recharge capacity of the north trench, causing the north wells to operate intermittently rather than continuously. We have observed that the north trench pumps, which are designed to shut off automatically when they run out of water, continue to shut down for hours at a time. No obvious correlation has been established with tidal levels. Net flow rates through the system vary between 3,400 and 4,200 gallons per day.

On a weekly basis, approximately 500 gallons of effluent water were used for inoculating the landfarmed contaminated soil on site. This practice of landfarming diesel contaminated trench spoils with nutrients and cultures is repeated every week provided the system is operating normally.

System Interruption: Excess Free Product

On May 9, routine system inspection revealed that a large volume of excess free product had been extracted from the south trench and had overwhelmed all 4 bioreactors. Groundwater pumping was stopped immediately.

The south system appeared to have accumulated more free product (aged diesel or "oil") than the north trench. The high volume aeration and efficient mixing inherent to these bioreactors caused a portion of the oil to emulsify. Some of this emulsified oil had passed into the 2,000 gallon holding tank during the normal flow of treated water (estimated at 3 gpm at that time). All four bioreactors clearly had excess free product floating on top of very dark contaminated water. Petroleum odor was very strong. Samples of emulsified product in water were taken from the second bioreactors of both the north and south systems (SW36, NW37). Small globules of free product were seen in the holding tank leading to fears that unacceptable levels of TPH might discharge into the interceptor (grab sample E38).

On May 10, aeration was shut off on all bioreactors and free product was skimmed off the water surface in each tank using built in skimmers. Two 55 gallon drums of oil-water slurry were collected from the south system with one additional drum from the north.

For the next ten days, the heavily contaminated bioreactors (278 to 1400 ppm TPH) were monitored for ammonium phosphate and oxygen to ensure maximum biodegradation rates. During this time, the oil-water separators were installed with a gravity feed system to allow the clarifier units to collect excess free product on continuous basis. A new oil recovery system was installed to permit periodic harvesting of free product. Each bioreactor work basin is now capable of storing up to 220 gallons of oil in 4, 55 gallon drums.

On May 15, the 2000 gallon holding tank was tested (E-40, no flow) for TPH levels before it was recirculated with the contents of the heavily contaminated south bioreactor system. Two days later, grab samples were taken again from the SW and NW bioreactors (SW44, NW45) and the holding tank (E43, No Flow). A small amount of free product was still observed in the south system, so discharge of the holding tank was postponed.

On May 22, grab samples were taken again (SW44, NW45, E46) as culture conditions appeared to improve. Unfortunately, the E46 sample was inadvertently contaminated with a trace of free product in the thick foam floating on the water surface in the holding tank. On this day, phosphate was found to be limiting. Both ammonium and phosphate levels were adjusted to 20-25 ppm.

On the morning of May 23 groundwater flow was re-started at 0.5 gpm per system. All four bioreactors (SE,SW,NE,NW) were inoculated with new Biosocks of diesel-blend bacteria. Ammonium and phosphate levels were adjusted to 25 ppm each.

On May 24, treated water effluent began to discharge again into the 2,000 gallon holding tank at 0.5 gpm per system. Cleaned water began discharging into the EBMUD interceptor on May 24 (EBMUD notified by telephone). Flow rates were boosted to 1.0 gpm for the south and 1.5 gpm for the north system. The north trench continued to pump irregularly as the depression zone dropped the water table below the pumps in the trench. An effluent sample (E-47) was taken on May 25, 24 hours after discharge to the interceptor had started. Without the north trench in full operation, the overall flow rate for the system was only 2 gpm (4,500 gallons per day). A 72 hour flow-through effluent discharge sample was taken on May 26 (E-49) along with a sample of combined north/south influent (I-48). On May 27, a 72 hour effluent sample was taken (E-50), and on May 28, a 96 hour flow-through sample was taken from the effluent discharge (E-51).

On May 29, the overall flow rate for the combined bioreactor systems was increased to 2.5 to 3.0 gpm, depending on the availability of groundwater in the north trench (the entire treatment system is still water-limited by the shortage of trenches). An effluent sample was taken to confirm water discharge quality (E-52). On May 30, samples were taken of the combined north/south trench influent (I-54) and the overall system effluent discharge at the interceptor (E-53). Flow rates were maintained in the range of 2.5 to 3.0 gpm, processing about 3,000 to 4,000 gallons of groundwater per day.

As of May 31, approx. 15 gallons of free product had been collected and stored on-site. P.I.E. has applied for a hazardous waste generators number.

Net groundwater treatment for May is estimated as follows:

Dates	Average Flow	Volume
May 1-9:	3 gpm	30,000 gal
May 23 - 31:	2 gpm	15,000 gal
	Est. treated grdwtr May:	45,000 gal
	Est. treated grdwtr April:	75,000 gal
	Plus est. treated grdwtr March:	25,000 gal
	Total groundwater treated to date:	145,000 gal

LABORATORY ANALYSIS OF GROUNDWATER TREATMENT SAMPLES

Tests run by Curtis & Tompkins, Ltd. on samples collected by CytoCulture field technicians:

1) EPA 602 - Volatile Aromatic Hydrocarbons in Water
2) EPA 8015 (modified) - Total Extractable Petroleum Hydrocarbons in Aqueous Solutions (TPH/TEH)

ND = Not Detectable; Detection limits for BTXE, ND = 1 ug/L; for TPH, ND = 0.5 mg/L

			ug/L (ppb)			mg/L (ppm)
No.	Date	Description / Comment	Benz.	Tol.	Xyl.	TPH/TEH
NORMAL GROUNDWATER TREATMENT PROGRAM				(ppb)		(ppm)
E-34	5/1	Combined System Effluent 3 gpm	ND	ND	ND	ND
E-35	5/4	Combined System Effluent 3.8 gpm	ND	ND	ND	ND
SW-36	5/15	SW Bioreactor, Excess Free-Product, No Flow	ND	ND	ND	1400
NW-37	5/9	NW Bioreactor, Excess	ND	ND	ND	278
E-38	5/9	2kgal Tank, No Flow	ND	ND	ND	138
E-40	5/15	Combined N/S Effluent 6 days After Free-Product, No Flow	ND	ND	ND	Trace
SW-41	5/17	SW Bioreactor, 8 days After Free-Product	ND	ND	ND	10

No.	Date	Description / Comment	Benz.	Tol. (ppb)	Xyl.	TPH/TEH (ppm)
NORMAL GROUNDWATER TREATMENT PROGRAM CONTINUED						
NW-42	5/17	NW Bioreactor, 8 days After Free-Product	ND	ND	ND	1.4
E-43	5/17	2kgal Tank After Mixing w/SW Reactor, No Flow	ND	ND	ND	32
SW-44	5/22	Combined Effluent at 48 hours After Flow	ND	ND	ND	6.0
NW-45	5/22	Combined Effluent at 48 hours After Flow	ND	ND	ND	ND
E-46	5/22	2kgal Tank After Mixing w/SW Reactor, No Flow, Sampled in Foam	ND	ND	ND	63 (Artifact)
E-47	5/25	Combined Effluent at 24 hours After Flow	ND	ND	ND	ND
I-48	5/26	Combined **INFLUENT**	ND	ND	800	ND
E-49	5/27	Combined Effluent at 48 hours After Flow	ND	ND	ND	ND
E-50	5/27	Combined Effluent at 72 hours After Flow	ND	ND	ND	ND
E-51	5/28	Combined Effluent at 96 hours After Flow	ND	ND	ND	ND
E-52	5/29	Combined Effluent at 120 hours After Flow	ND	ND	ND	ND
E-53	5/30	Combined Effluent at 144 hours After Flow	ND	ND	ND	ND
I-54	5/30	Combined **INFLUENT** during Free-Product Recovery	ND	320	ND	ND

Effluent treated water now being discharged into the EBMUD interceptor is at non-detectable levels of BTXE and total extractable petroleum hydrocarbons. Upon standing 20 minutes to allow the bacterial floc to settle, this treated water appears clear and odorless.

Aeration and mixing are continuous, providing saturated oxygen levels in the water and little accumulation of sediment on the bottom of the tanks. The aeration blower and air compressor for powering the pneumatic well pumps in the extraction trenches performed very well in the field. After proper adjustment, the well pumps themselves now easily deliver 2 gpm apiece (there are two wells per trench), although the tidally influenced north well works intermittently.

Daily observations of the turbidity, color and foam accumulation confirmed that the bioreactors were maintaining healthy bacterial cultures. Continual diammonium phosphate addition kept ammonium nitrogen levels at 60 ppm or greater, and ortho phosphate levels at 30 ppm or greater, to ensure adequate nutrients for full degradation of the diesel COD. When the bioreactors were overwhelmed with free-product, they took days to recover.

All discharges of treated water leaving either bioreactor system are directed first to the 2,000 gallon aerated holding tank. This tank continues to serve as a final "polishing" step in the biological treatment process by extending the actual retention rate of contaminated water within the system.

Soil infiltration with treated water and bacterial cultures will utilize the effluent from the 2,000 gallon aerated holding tank which is now being discharged into the EBMUD interceptor.

Progress in Obtaining Permission to Reinfiltrate Treated Water

CytoCulture plans to construct a series of infiltration galleries under the parking lot pavement along both sides of building D (upfield of both the north and south extraction trenches in an attempt to achieve some "hydraulic control" of infiltrated water). Please refer to CytoCulture's Phase II Report and Operational Plan for details on the proposed infiltration program for seeding contaminated soil with bacteria.

The Regional Water Quality Control Board (SF Bay Region) is giving consideration to CytoCulture's request to reinfiltrate the treated water with bacteria and nutrients. Meetings with this group are anticipated for early July.

John P. Humphries
Assistant Project Director, for
Randall J. von Wedel, Ph. D.

CytoCulture Bioremediation Project
for P.I.E. Nationwide former Truck Terminal Site
Emeryville, CA

Laboratory Analytical Results for ~~April~~ May 1989
including BTXE, TPH/TEH and Lead Data
provided by Curtis & Tompkins, Ltd.

Each sample data set is preceded by the
corresponding Chain of Custody sheet

1733

Chain of Custody Form

Curtis & Tompkins, Ltd
2323 Fifth Street
Berkeley, California 94710
(415) 486-0900

Samplers: R v W

Job Description: PIE

Job Number: Cyto

Client Contact: R von Wedel

Recorder: R v W

Matrix: Water	Soil	Waste	Oil			# Containers	Method Preserved: H_2SO_4	HNO_3	Ice	None	Other	Sample Number	Sampling Date: Yr	Mo	Dy	Time	SAMPLE NOTES
X										X		E-34	89	05	01	1400	

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Title 22 Metals	EPA PP Metals (#)	TPH Method-TEH	Benzene-Toluene-Xylene(s)	Oil and Grease	EPA 608/8080 Pesticides & PCB's
						X	X		

Laboratory Notes :

1wk please (Mon 5/8)

Chain of Custody Record

Relinquished by: (signature) Date/Hr	Received by (signature)
R von Wedel	
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Dispatched by: (signature) Date/Hr	Received for Lab by (signature) 5/1/89

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710 Phone (415) 486-0900

LABORATORY NUMBER: 17303
CLIENT: CYTO CULTURE
PROJECT #: E-34
LOCATION: PIE EMERYVILLE

DATE RECEIVED: 05/01/89
DATE ANALYZED: 05/05/89
DATE REPORTED: 05/11/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
17303-1A	E-34	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
17303-1B	E-34	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	4
Spike: % Recovery	102

LABORATORY DIRECTOR

Curtis & Tompkins Ltd

LABORATORY NUMBER: 17303
CLIENT: CYTO CULTURE
SAMPLE-ID: E-34

DATE RECEIVED: 05/01/89
DATE ANALYZED: 05/05/89
DATE REPORTED: 05/11/89

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	ND	1
Toluene	ND	1
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected

QA/QC SUMMARY

RPD %	4
SPIKE RECOVERY %	99

Chain of Custody Form

Curtis & Tompkins, Ltd
2323 Fifth Street
Berkeley, California 94710
(415) 486-0900

Samplers: R. v W

Job Description: PIE

Job Number: Cyto

Client Contact: R. vanWesel

Recorder: R. v W

Matrix: Water	Soil	Waste	Oil			*Containers	Method Preserved: H_2SO_4	HNO_3	Ice	None	Other	Sample Number	Sampling Date: Yr	Mo	Dy	Time	SAMPLE NOTES
X									X			E-35	89	05	04	1400	Effluent
																	2 hr after
																	slight free product

ANALYSIS REQUESTED	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Title 22 Metals	EPA PP Metals (#)	TPH Method- TEH	Benzene-Toluene-Xylene(s)	Oil and Grease	EPA 608/8080 Pesticides & PCB's
							X	X		

Laboratory Notes : 1 wk

Chain of Custody Record

Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Dispatched by: (signature) Date/Hr	Received for Lab by (signature)

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 17352
CLIENT: CYTO CULTURE
PROJECT ID: PIE EMERYVILLE

DATE RECEIVED: 05/05/89
DATE ANALYZED: 05/09/89
DATE REPORTED: 05/15/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
17352-1	E-35	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	5
Spike: % Recovery	89

Curtis & Tompkins Ltd

LABORATORY NUMBER:
CLIENT: CYTO-CULTURE INTERNATIONAL
PROJECT: PIE EMERYVILLE

DATE RECEIVED: 05/05/89
DATE ANALYZED: 05/09/89
DATE REPORTED: 05/15/89

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	ND	1
Toluene	ND	1
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected

QA/QC SUMMARY

RPD %	9
SPIKE RECOVERY %	99

Chain of Custody Form

Curtis & Tompkins, Ltd
2323 Fifth Street
Berkeley, California 94710
(415) 486-0900

Samplers: R von Wedel

Job Description: PIE

Job Number: Cyto

Client Contact: R. von Wedel

Recorder: R von Wedel

Matrix: Water	Soil	Waste	Oil			#Containers	Method Preserved: H_2SO_4	HNO_3	Ice	None	Other	Sample Number	Sampling Date: Yr	Mo	Dy	Time	SAMPLE NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Title 22 Metals	EPA PP Metals (#)	TPH Method- TGH -	Benzene-Toluene-Xylene(s)	Oil and Grease	EPA 608/8080 Pesticides & PCB's
X										X		SW-36	89	05	09	1500	South bioreactor							X	X	X	
X										X		NW-37	89	05	09	1510	North bioreactor							X	X	X	
X										X		E 38	89	05	09	1520	2000gal holding tank							X	X	X	
																	(samples w/ free product in aerated suspension)										
																	SW-36 has 0.02% dehydrant										

Laboratory Notes :

Analyze water only after separating residual free product

lwk please

Chain of Custody Record

Relinquished by: (signature) Date/Hr	Received by (signature)
R von Wedel	
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Dispatched by: (signature) Date/Hr	Received by Lab by (signature) 5/10/89 1700

Curtis & Tompkins Ltd

LABORATORY NUMBER: 17377
CLIENT: CYTO CULTURE
LOCATION: PIE EMERYVILLE

DATE RECEIVED: 05/10/89
DATE ANALYZED: 05/15/89
DATE REPORTED: 05/19/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
17377-1	SW-36	ND(10)	ND(10)	1,400*	ND(10)
17377-2	NW-37	ND(0.5)	ND(0.5)	278*	ND(0.5)
17377-3	E-38	ND(0.5)	ND(0.5)	138*	ND(0.5)

* Fingerprint pattern does not match Hydrocarbon standards. Quantitation based on largest peaks within C12 to C22 boiling range.

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	6
Spike: % Recovery	103

Curtis & Tompkins Ltd

LABORATORY NUMBER: 17377-1
CLIENT: CYTO CULTURE
SAMPLE ID: SW-36

DATE RECEIVED: 05/10/89
DATE ANALYZED: 05/17/89
DATE REPORTED: 05/19/89

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	ND	10
Toluene	ND	10
Ethyl Benzene	ND	10
Total Xylenes	ND	10
Chlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
1,3-Dichlorobenzene	ND	10
1,2-Dichlorobenzene	ND	10

ND = None Detected

QA/QC SUMMARY

RPD %	7
SPIKE RECOVERY %	104

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 17377-2
CLIENT: CYTO CULTURE
SAMPLE ID: NW-37

DATE RECEIVED: 05/10/89
DATE ANALYZED: 05/17/89
DATE REPORTED: 05/19/89

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	ND	10
Toluene	ND	10
Ethyl Benzene	ND	10
Total Xylenes	ND	10
Chlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
1,3-Dichlorobenzene	ND	10
1,2-Dichlorobenzene	ND	10

ND = None Detected

QA/QC SUMMARY

RPD %	7
SPIKE RECOVERY %	104

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 17377-3
CLIENT: CYTO CULTURE
SAMPLE ID: E-38

DATE RECEIVED: 05/10/89
DATE ANALYZED: 05/17/89
DATE REPORTED: 05/19/89

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	ND	10
Toluene	ND	10
Ethyl Benzene	ND	10
Total Xylenes	ND	10
Chlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
1,3-Dichlorobenzene	ND	10
1,2-Dichlorobenzene	ND	10

ND = None Detected

QA/QC SUMMARY

RPD %	7
SPIKE RECOVERY %	104

Curtis & Tompkins, Ltd
2323 Fifth Street
Berkeley, California 94710
(415) 486-0900

Chain of Custody Form

Samplers: Ruw

Job Description: PIE

Job Number: cyto

Client Contact: RvonWedel

Recorder: Ruw

Matrix: Water	Soil	Waste	Oil			#Containers	Method Preserved: H_2SO_4	HNO_3	Ice	None	Other	Sample Number	Yr	Mo	Dy	Time	SAMPLE NOTES
X										X		E-40	89	05	15	1300	2000 gal tank sample (no flow) after ~6 days since free product entered. (see E-39

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Title 22 Metals	EPA PP Metals (#)	TPH Method- TEH	Benzene-Toluene-Xylene(s)	Oil and Grease	EPA 608/8080 Pesticides & PCB's					
						X	X							

Laboratory Notes: By FRI May 19 please

No sample 39

Chain of Custody Record

Relinquished by: (signature) Date/Hr	Received by (signature)
RvonWedel 5/15 1430	
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Dispatched by: (signature) Date/Hr	Received for Lab by (signature) [signature] 5/15/89 1430

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 17405
CLIENT: CYTO CULTURE
LOCATION: PIE EMERYVILLE

DATE RECEIVED: 05/15/89
DATE ANALYZED: 05/16/89
DATE REPORTED: 05/19/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
17405-1	E-40	ND(0.5)	ND(0.5)	ND(0.5)	TRACE *

* Hydrocarbons in C9-C12 range.

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	7
Spike: % Recovery	81

LABORATORY DIRECTOR

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 17405
CLIENT: CYTO CULTURE
JOB LOCATION: PIE EMERYVILLE

DATE RECEIVED: 05/15/89
DATE ANALYZED: 05/17/89
DATE REPORTED: 05/19/89

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/kg)	TOLUENE (ug/kg)	TOTAL XYLENES (ug/kg)	ETHYL BENZENE (ug/kg)
17405-1	E-40	ND(1)	ND(1)	ND(1)	ND(1)

QA/QC SUMMARY

%RPD	7
%RECOVERY	104

Chain of Custody Form

Curtis & Tompkins, Ltd
2323 Fifth Street
Berkeley, California 94710
(415) 486-0900

Samplers: D. V.

Job Description: PIE

Job Number: Cyto

Client Contact: R. VanWedel

Recorder: J. P. H.

Matrix: Water	Matrix: Soil	Matrix: Waste	Matrix: Oil	# Containers	Method Preserved: H_2SO_4	Method Preserved: HNO_3	Method Preserved: Ice	Method Preserved: None	Method Preserved: Other	Sample Number	Sampling Date: Yr	Mo	Dy	Time	SAMPLE NOTES
X								X		SW-41	89	05	17	1240	SW Reactor
X								X		NW-42	89	05	17	1240	NW "
X								X		E-43	89	05	17	1240	2000 gal tank
															grab samples after 6-8 days since free product NO FLOW

ANALYSIS REQUESTED	
EPA 601/8010	
EPA 602/8020	
EPA 624/8240	
EPA 625/8270	
Title 22 Metals	
EPA PP Metals ( )	
TPH Method- TEH	X
Benzene-Toluene-Xylene(s)	
Oil and Grease	
EPA 608/8080 Pesticides & PCB's	

Laboratory Notes :

~~Hold~~ for ~~Mon~~ May 22

Chain of Custody Record

Relinquished by: (signature) Date/Hr	Received by (signature)
R. VanWedel 5/17 1300	
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Dispatched by: (signature) Date/Hr	Received for Lab by (signature)
	Nancy Holden 5/17 1200

Curtis & Tompkins, Ltd., Analytical Laboratories. Since 1878
2323 Fifth Street, Berkeley, CA 94710. Phone (415) 486-0900

LABORATORY NUMBER: 17420
CLIENT: CYTO CULTURE
LOCATION: PIE EMERYVILLE

DATE RECEIVED: 05/17/89
DATE ANALYZED: 05/18/89
DATE REPORTED: 05/22/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
17420-1	SW-41	ND(0.5)	ND(0.5)	10 *	ND(0.5)
17420-2	NW-42	ND(0.5)	ND(0.5)	1.4 *	ND(0.5)
17420-3	E-43	ND(0.5)	ND(0.5)	32 *	ND(0.5)

* Fingerprint pattern does not match hydrocarbon standards; quantitation based on largest peaks within C12-C22 range.

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	1
Spike: % Recovery	95

LABORATORY DIRECTOR

Curtis & Tompkins, Ltd
2323 Fifth Street
Berkeley, California 94710
(415) 486-0900

Chain of Custody Form

Samplers: D. V.

Job Description: PIE

Job Number: cyto

Client Contact: R. vonwedel

Recorder: J. P. H.

Matrix: Water	Matrix: Soil	Matrix: Waste	Matrix: Oil	# Containers	Method Preserved: H_2SO_4	Method Preserved: HNO_3	Method Preserved: Ice	Method Preserved: None	Method Preserved: Other	Sample Number	Sampling Date: Yr	Mo	Dy	Time	SAMPLE NOTES
X								X		SW-41	89	05	17	1240	SW Reactor
X								X		NW-42	89	05	17	1240	NW "
X								X		E-43	89	05	17	1240	2000gal tank
															grabs samples after 6-8 days since free product NO FLOW

ANALYSIS REQUESTED														
EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Title 22 Metals	EPA PP Metals (#)	TPH Method- TEH	Benzene-Toluene-Xylene(s)	Oil and Grease	EPA 608/8080 Pesticides & PCB's					
						X								
						X								
						X								

Laboratory Notes :

~~Water~~ for ~~TEH~~ Mon May 22

Chain of Custody Record

Relinquished by: (signature) Date/Hr	Received by (signature)
R. vonwedel 5/17 1300	
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Dispatched by: (signature) Date/Hr	Received for Lab by (signature)
	Nancy Kelley 5/17 1200

Chain of Custody Form

Curtis & Tompkins, Ltd
2323 Fifth Street
Berkeley, California 94710
(415) 486-0900

Samplers: JPH

Job Description: PIE

Job Number: Cyto

Client Contact: R. Von Wedel

Recorder: JPH

Matrix: Water	Soil	Waste	Oil			#Containers	Method Preserved: H_2SO_4	HNO_3	Ice	None	Other	Sample Number	Sampling Date: Yr	Mo	Dy	Time	SAMPLE NOTES
X						1				X		SW-44	91	05	22		SW Reactor
X						1				X		NW-45	91	05	22		NW Reactor
X						1				X		E-46	91	05	22		2000gal Tank
																	(Grab Samples after 9-12 days since free-product NO FLOW)

ANALYSIS REQUESTED	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Title 22 Metals	EPA PP Metals (#)	TPH Method- TEH	Benzene-Toluene-Xylene(s)	Oil and Grease	EPA 608/8080 Pesticides & PCB's
							X			
							X			
							X			

Laboratory Notes :

24 hr. turnaround

Chain of Custody Record

Relinquished by: (signature) Date/Hr	Received by (signature)
J P Hyrk 5/22 12:16	
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Dispatched by: (signature) Date/Hr	Received for Lab by (signature)
	Nancy Lin

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street Berkeley CA 94710 Phone (415) 486-0900

LABORATORY NUMBER: 17443
CLIENT: CYTO CULTURE INTERNATIONAL
PROJECT ID: PIE EMERYVILLE

DATE RECEIVED: 05/22/89
DATE ANALYZED: 05/24/89
DATE REPORTED: 05/24/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
17443-1	SW-44	ND(0.5)	ND(0.5)	6.0*	ND(0.5)
17443-2	NW-45	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
17443-3	E-46	ND(0.5)	ND(0.5)	63*	ND(0.5)

* Fingerprint pattern does not match Hydrocarbon Standards. Quantitation based on largest peaks within C12-C22 boiling range.

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	9
Spike: % Recovery	101

LABORATORY DIRECTOR

Curtis & Tompkins, Ltd
2323 Fifth Street
Berkeley, CA 94710
Phone 415-486-0900
FAX 415-486-0532

Chain of Custody Form

Samplers: JPH / RvW (E47)

Job Description: PIE - Emeryville

Job Number: Cyto

Client Contact: Randall von Wedel (John Humphries)

Recorder: JPH

Matrix: Water	Soil	Waste	Oil	#Containers	H_2SO_4	HNO_3	Ice	None	Other	Sample Number	Yr	Mo	Dy	Time	SAMPLE NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	CAM 17 Metals	EPA PP Metals (#)	TPH Method- TEH	Benzene-Toluene-Xylene(s)	Oil and Grease	EPA 608/8080 Pest's&PCB's
X				3				X		E47	89	05	25	2000	3gpm Effluent								X		
X				3			-	X		I48	89	05	26		N/S combined influent							X	X		
				3				X		E49	89	05	26		3gpm effluent							X	X		

Laboratory Notes :

24 hr turnaround

FAX lab results to 564-1986 by Tues 5/30 at 5 PM

Sample Aqueous Phase. Thankyou

Chain of Custody Record

Relinquished by: (signature) Date/Hr	Received by (signature)
[signature] 5/26 1:20 PM	
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Dispatched by: (signature) Date/Hr	Received for Lab by (signature)
	[signature]

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 05/26/89
DATE REPORTED: 05/31/89

LAB NUMBER: 17478

CLIENT: CYTO CULTURE INTERNATIONAL

REPORT ON: 3 WATER SAMPLES

PROJECT ID: PIE EMERYVILLE

RESULTS: SEE ATTACHED

Laboratory Director

Curtis & Tompkins Ltd

LABORATORY NUMBER: 17478
CLIENT: CYTO CULTURE INTERNATIONAL
PROJECT ID: PIE EMERYVILLE

DATE RECEIVED: 05/26/89
DATE ANALYZED: 05/30/89
DATE REPORTED: 05/31/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
17478-1A	E 47	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
17478-2A	I 48	ND(10)	ND(10)	800*	ND(10)
17478-3A	E 49	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

*Fingerprint pattern does not match hydrocarbon standard. Quantitation based on diesel standard.

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	15
Spike: % Recovery	79

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 17478
CLIENT: CYTO CULTURE INTERNATIONAL
PROJECT ID: PIE EMERYVILLE

DATE RECEIVED: 05/26/89
DATE ANALYZED: 05/26/89
DATE REPORTED: 05/31/89

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 602
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/L)	TOLUENE (ug/L)	TOTAL XYLENES (ug/L)	ETHYL BENZENE (ug/L)
17478-1B	E 47	ND(1)	ND(1)	ND(1)	ND(1)
17478-2B	I 48	300	21	20	ND(1)
17478-3B	E 49	ND(1)	ND(1)	ND(1)	ND(1)

QA/QC SUMMARY

%RPD	2
%RECOVERY	103

Chain of Custody Form

Curtis & Tompkins, Ltd
2323 Fifth Street
Berkeley, California 94710
(415) 486-0900

Samplers: DW

Job Description: PE Emeryville

Job Number: Cyta

Client Contact: Randall von Wodtke

Recorder: DW

Matrix						# Containers	Method Preserved					Sample Number	Sampling Date				SAMPLE NOTES
Water	Soil	Waste	Oil				H_2SO_4	HNO_3	Ice	None	Other		Yr	Mo	Dy	Time	
✓						1			✓			E50	89	05	27	1080	1 gpm Effluent
✓						3			✓			E51	89	05	28	1140	NPS Combined
✓						3			✓			E52	89	05	29	1400	"
✓						3			✓			E53	89	05	30	1430	"
✓						3			✓			~~IN48T54~~	89	05	30	1430	1.5 Inches S

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Title 22 Metals	EPA PP Metals (#)	TPH Method- TEH	Benzene-Toluene-Xylene(s)	Oil and Grease	EPA 608/8080 Pesticides & PCB's
						X	X		
						X	X		
						X	X		
						X	X		
						X	X		

Laboratory Notes :

1 week TAT

Chain of Custody Record

Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Relinquished by: (signature) Date/Hr	Received by (signature)
Dispatched by: (signature) Date/Hr	Received for Lab by (signature) 1430

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street Berkeley, CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 17486
CLIENT: CYTO-CULTURE INTERNATIONAL
PROJECT:- PIE EMERYVILLE

DATE RECEIVED: 05/30/89
DATE ANALYZED: 06/02/89
DATE REPORTED: 06/06/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
17486-1	E-50	ND(0.5)	ND(0.5)	ND(0.5)
17486-2A	E-51	ND(0.5)	ND(0.5)	ND(0.5)
17486-3A	E-52	ND(0.5)	ND(0.5)	ND(0.5)
17486-4A	E-53	ND(0.5)	ND(0.5)	ND(0.5)
17486-5A	I-54	ND(10)	320*	ND(10)

* Fingerprint pattern does not match Hydrocarbon standard. Quantitation based on largest peaks withing C12-C22 boiling range.

ND = Not Detected; Limit of detection in parentheses.

LABORATORY DIRECTOR

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 17486-1
CLIENT: CYTO-CULTURE INTERNATIONAL
PROJECT: PIE EMERYVILLE
SAMPLE #: E-50

DATE RECEIVED: 05/30/89
DATE ANALYZED: 05/31/89
DATE REPORTED: 06/06/89

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	ND	1
Toluene	ND	1
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected

QA/QC SUMMARY

RPD %	2
SPIKE RECOVERY %	100

Curtis & Tompkins Ltd

LABORATORY NUMBER: 17486-2B
CLIENT: CYTO-CULTURE INTERNATIONAL
PROJECT: PIE EMERYVILLE
SAMPLE #: E-51

DATE RECEIVED: 05/30/89
DATE ANALYZED: 05/31/89
DATE REPORTED: 06/06/89

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	ND	1
Toluene	ND	1
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected

QA/QC SUMMARY

RPD %	2
SPIKE RECOVERY %	100

Curtis & Tompkins Ltd

LABORATORY NUMBER: 17486-3B
CLIENT: CYTO-CULTURE INTERNATIONAL
PROJECT: PIE EMERYVILLE
SAMPLE #: E-52

DATE RECEIVED: 05/30/89
DATE ANALYZED: 05/31/89
DATE REPORTED: 06/06/89

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	ND	1
Toluene	ND	1
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected

QA/QC SUMMARY

RPD %	2
SPIKE RECOVERY %	100

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 17486-4B
CLIENT: CYTO-CULTURE INTERNATIONAL
PROJECT: PIE EMERYVILLE
SAMPLE #: E-53

DATE RECEIVED: 05/30/89
DATE ANALYZED: 05/31/89
DATE REPORTED: 06/06/89

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	ND	1
Toluene	ND	1
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected

QA/QC SUMMARY

RPD %	2
SPIKE RECOVERY %	100

Curtis & Tompkins Ltd

LABORATORY NUMBER: 17486-5B
CLIENT: CYTO-CULTURE INTERNATIONAL
PROJECT: PIE EMERYVILLE
SAMPLE #: I-54

DATE RECEIVED: 05/30/89
DATE ANALYZED: 05/31/89
DATE REPORTED: 06/06/89

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	290	1
Toluene	13	1
Ethyl Benzene	9	1
Total Xylenes	14	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected

QA/QC SUMMARY

RPD %	2
SPIKE RECOVERY %	100

Daily Facility Log Sheets for April 1989

CytoCulture - PIE Bioremediation Project, Emeryville

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: Rulo

DATE: May 1 TIME: 1:15 pm HIGH TIDE: 9 pm

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill At2 Discharge 0+16 Pressure 80

East well flow setting: full → now stronger than west well West well flow setting: full ← not as strong

NORTH TRENCH: Refill ____ Discharge 0+2 Pressure ____

South well flow setting: ____ North well flow setting: ____

COMPRESSOR CHECKS: Hours 1145 Temperature 145° Oil ok-clean

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in. South system: ____ in. Blower: 82 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 0.4 GPM South Trench: 2.4-2.5 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 2.8-3 GPM

3pm After change: N = 2.0 S = 2.[illegible] Total = 4.5g[illegible] without Northtren[illegible]

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10 / 10 100 % South: 10 / 10 100 %

DATE OF LAST ~~BIOSOCK~~ INOCULATIONS: (# per unit)

North Units: ~~4/22~~ TODAY, Replaced both #1 + #2 — #1 had broken South Units: 4/27 2,000 Gal. Unit 4/22 changed today

changed #1 only

CULTURE OBSERVATIONS: good foam in all but South #1 → Replaced biosock both #1 + #2 Water Temperature: ____ Deg.C.

ODOURs: North system looks v. healthy — broken fouled culture, no foam [NH4]: ____ [PO4]: ____

2 biosocks remaining → re-order

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No E-34 TPH/TEH: ✓ BTXE: ✓ Comment: Routine effluent check at ~3gpm

Sample No. ____ TPH/TEH: ____ BTXE: ____ Comment: ____

OPERATIONAL CHANGES TODAY:

Replaced all well riser tubing (½" air, ¾" discharge) to avoid further air leaks with defective bonded tubing on all 4 wells (9-12' ea); Divert some of South flow to North

North trench B only intermittent flow (low tide na[illegible]

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: DCU

DATE: May 2 TIME: 1900 HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill ~~2+1½~~ A+2 Discharge 0+1½ Pressure 80

East well flow setting: Full West well flow setting: Full

NORTH TRENCH: Refill A+2 Discharge 0+2 Pressure 80

South well flow setting: _____ North well flow setting: _____

COMPRESSOR CHECKS: Hours 175 Temperature 145 Oil N/C leak

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in. South system: 82 in. Blower: 82 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 2 GPM South Trench: 1.75 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 3.75 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10/10 100% South: 10/10 100%

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 5/1 South Units: 5/1 2,000 Gal. Unit 4/27

CULTURE OBSERVATIONS: Water Temperature: ____ Deg.C.

DOURs: [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. _____ TPH/TEH: ___ BTXE: ___ Comment: _____

Sample No. _____ TPH/TEH: ___ BTXE: ___ Comment: _____

OPERATIONAL CHANGES TODAY:

Free Product in N/S Dio Brine Circulated By Draft T...

↳ easily dispersed/emulsified in bioreactor

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: RWO

DATE: 5/3 TIME: 130 HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill A+2 Discharge 0+1½ Pressure 80

East well flow setting: Full West well flow setting: Full

NORTH TRENCH: Refill A+2 Discharge 0+2 Pressure 80

South well flow setting: — North well flow setting: Full

COMPRESSOR CHECKS: Hours 1193 Temperature 150 Oil V/clear

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in. South system: 72 in. Blower: 81 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 1.0-1.5 GPM Intermittent South Trench: 2.0 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 3-3.5 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10 / 10 95 % South: 10 / 10 95 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 5/1 South Units: 5/1 2,000 Gal. Unit 4/27

CULTURE OBSERVATIONS: Water Temperature: ____ Deg.C.

DOURs: [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

~~Sample~~ No. ____ TPH/TEH: ___ BTXE: ___ Comment: _____

Sample No. ____ TPH/TEH: ___ BTXE: ___ Comment: _____

OPERATIONAL CHANGES TODAY: normal flow, light brown foam on N system
water is light honey colored with good bacterial floc.
all looks healthy, no free product today.

Sybron here again today · G. Hater

Visitors today
1) EBMUD – 9 people w/ (Bill Model)
2) Chris Fallon
3) Tom Graham Marton Properties

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: RVW

DATE: 5/4/89 TIME: 10-2³⁰pm HIGH TIDE: 10am

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill A+1½ Discharge 0+1½ Pressure 80

East well flow setting: full West well flow setting: full

NORTH TRENCH: Refill A+2 Discharge 0+2 Pressure 80

South well flow setting: full North well flow setting: full

COMPRESSOR CHECKS: Hours 1218 (2pm) Temperature 150° Oil OK

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in. South system: 80 in. Blower: 82 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: (intermittent) <0.5 GPM South Trench: 2.0-2.5 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 2.5-3 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10/10 95 % South: 10/20 95 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 5/1 South Units: 5/1 2,000 Gal. Unit 5/1

CULTURE OBSERVATIONS: Water Temperature: ____ Deg.C.

DOURs: (little foam on north + south not enough diesel coming through.) [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. E-35 TPH/TEH: ✓ BTXE: ✓ Comment: Effluent 2000

Sample No. ____ TPH/TEH: ____ BTXE: ____ Comment: ____

OPERATIONAL CHANGES TODAY: – minor "puddles"

48 hr after some free product introduced to North system on 5/3

↳ via SE well equipped with skimmer on 4/20

12 \ – ~p = 145

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: R.W

DATE: 5/5/89 TIME: 11 AM HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill A+½ Discharge 04½ Pressure 30

East well flow setting: Full a scaws weak West well flow setting: Full

NORTH TRENCH: Refill A+2 Discharge 0+2 Pressure 30

South well flow setting: — North well flow setting: Full

COMPRESSOR CHECKS: Hours 1244 Temperature 145 Oil clear

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in. South system: 30 in. Blower: 82 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 0.5-1 GPM South Trench: 2-2.5 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 3-3.5 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10/10 90 % South: 10/20 95 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 5/1 South Units: 5/1 2,000 Gal. Unit 4/27

CULTURE OBSERVATIONS: Water Temperature: ____ Deg.C.

DOURs: [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

~~Sample~~ No._____ TPH/TEH:___ BTXE:___ Comment:_____

Sample No._____ TPH/TEH:___ BTXE:___ Comment:_____

OPERATIONAL CHANGES TODAY: None - ok

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: R VonWald

DATE: 5/8 TIME: 9:00 AM HIGH TIDE: ____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill ____ Discharge ____ Pressure ____

East well flow setting: ____ West well flow setting: ____

NORTH TRENCH: Refill ____ Discharge ____ Pressure ____

South well flow setting: ____ North well flow setting: ____

COMPRESSOR CHECKS: Hours 1310 Temperature 140 Oil clear

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in. South system: 80 in. Blower: 82 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 1 gpm GPM South Trench: 2.5 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 3.5 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10/10 90 % South: 10/20 90 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 5/1 South Units: 5/1 2,000 Gal. Unit 4/27

CULTURE OBSERVATIONS:

DOURs: [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. ____ TPH/TEH: ____ BTXE: ____ Comment: ____

Sample No. ____ TPH/TEH: ____ BTXE: ____ Comment: ____

OPERATIONAL CHANGES TODAY: None - Just checking in with R. Menges. Everything OK

V. little free product

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: RvW

DATE: 5/9/89 TIME: 1130 am HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill ___ Discharge ___ Pressure +

East well flow setting: ✓ West well flow setting: ✓

NORTH TRENCH: Refill ___ Discharge ___ Pressure ___

South well flow setting: ✓ North well flow setting: ✓

COMPRESSOR CHECKS: Hours 1338 Temperature 150° Oil ✓

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in. South system: 82 in. Blower: 82 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: ~1 GPM South Trench: ~2 (was ~2 → ∅) GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 3 (was 3 → ∅) GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10 / 10 95 % South: 10 / 10 95 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 5/1 South Units: 5/1 2,000 Gal. Unit 4/27

CULTURE OBSERVATIONS:

DOURs: [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. SW36 NW37 TPH/TEH: ✓ BTXE: ✓ Comment: Aqueous phase - not oil

Sample No. HOLDTK 38 TPH/TEH: ✓ BTXE: ✓ Comment: _____

OPERATIONAL CHANGES TODAY: SHUT DOWN water flow - Excess free product (oil slick) in all four bioreactors, but especially south system. Some globules of oil have made it to the holding tank. Samples taken of NW, SW and holding tank directly - obvious that oil has emulsified in bioreactors. Added 200 ml "dawn" detergent to both south units; none added to north system

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: _____

DATE: 5/10 TIME: 1PM → 7PM HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH (OFF): Refill ____ Discharge ____ Pressure ____

East well flow setting: _____ West well flow setting: _____

NORTH TRENCH (OFF): Refill ____ Discharge ____ Pressure ____

South well flow setting: _____ North well flow setting: _____

COMPRESSOR CHECKS: Hours 138 OFF Temperature — Oil —

Air Filter drain checks: 1) ____ 2) ____ 3) ____

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in. South system: 80 in. Blower: 92 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: ϕ GPM South Trench: ϕ GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: ϕ GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: OFF/ 90 % South: OFF/ 90 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 5/9 (2) South Units: 5/9 (2) 2,000 Gal. Unit 5/8 (1)

CULTURE OBSERVATIONS: Water Temperature: ____ Deg. C.

DOURs: South system - no visible flock, very dark water = detergent emulsified oil
North system - thick flock plus biomass growing on surface

[NH4]: [PO4]: → not sure about bacteria

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. _____ TPH/TEH: ___ BTXE: ___ Comment: 2000 gal tank very high flock - looks healthy

Sample No. _____ TPH/TEH: ___ BTXE: ___ Comment: _____

OPERATIONAL CHANGES TODAY:

3hr - Skimmed free product (oil) off all 4 bioreactors - ~90 gal South, 50 gal North = 140 gal total
estimate only 5-8% oil, so 140 gal = 7+ gals

Sloppy volumes:

1 hr: cleaned residual oil;

1 hr: skimmed about 2 Quarts oil off 2000 gal - no more free product

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: RWW / JH

DATE: 5/17 TIME: 1230 pm HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

ϕ SOUTH TRENCH: Refill ___ Discharge ___ Pressure ___

East well flow setting: _____ West well flow setting: _____

ϕ NORTH TRENCH: Refill ___ Discharge ___ Pressure ___

South well flow setting: _____ North well flow setting: _____

COMPRESSOR CHECKS: Hours 1343 Temperature <60 Oil OK

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in. South system: 80 in. Blower: 83 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: ϕ GPM South Trench: ϕ GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: ϕ GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: ~~1~~ 50 % South: ~~1~~ 50 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 5/10 (2) South Units: 5/10 (2) 2,000 Gal. Unit 5/10 (1)

CULTURE OBSERVATIONS: pH = 7.0 on South & North Water Temperature: 10 Deg.C.

DOURs: Slow : 1-2 mg/l/hr [NH4]: N >30 S >30 [PO4]: N: ~20-25 ppm S ~5 ppm → Added 1 liter dry DAP to each South reactor

Sheen on N/S bioreactors

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

~~Sample~~ No. SW41 TPH/TEH: ✓ BTXE: — Comment: 6-8 days after free product

Sample No. MW-42 (E. 43) TPH/TEH: ✓ BTXE: — Comment: " " " "

E - low flow (grab sample)

OPERATIONAL CHANGES TODAY:

1pm Added 1 new biosock to each bioreactor and holding tank

Recirculated approx 500 gal from south system through holding tank and back

New 2000 gal tank has food odor + petroleum odor

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: JPH/DV

DATE: 5/22 TIME: 11:00 HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill ___ Discharge ___ Pressure ___

No Flow East well flow setting: _____ West well flow setting: _____

NORTH TRENCH: Refill ___ Discharge ___ Pressure ___

No Flow South well flow setting: _____ North well flow setting: _____

No Flow COMPRESSOR CHECKS: Hours 1343 Temperature Ø Oil OK

Air Filter drain checks: 1) — 2) — 3) —

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS: Temp. O.K.

North system: 82 in. South system: 81 in. Blower: 82 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 0 GPM South Trench: 0 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 0 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: ___/___ _____% South: ___/___ _____%

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit) 5/19

North Units: 5/19 1-2lb. each South Units: 1-2lb. each 2,000 Gal. Unit 1-2lb.

pH's SW: 6.5 SE: 6.5 HT: 6.5 NE: 7.0 NW: 7.0

CULTURE OBSERVATIONS: Water Temperature: ___ Deg.C.

HOURS: EHT lots of foam, others normal foam. Smell + sheen light in all tanks.

[NH4]: SE: >10ppm SW: >10 ppm EHT: >10ppm NE >10ppm NW >10ppm

[PO4]: SW: ~3.5ppm EHT: 0ppm NE 1-2 ppm

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

SW Sample No. SW 44 TPH/TEH: ✓ BTXE: — Comment: 9-11 days after Free-product rec.

NW Sample No. NW 45 TPH/TEH: ✓ BTXE: — Comment: _____

12000 EHT E 46

OPERATIONAL CHANGES TODAY: None except to add DAP to 2000 gal. tank

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: AC / JPH

DATE: 5-23 TIME: 1530 HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill 6+2 Discharge 0+2 Pressure 90

East well flow setting: F West well flow setting: F

NORTH TRENCH: Refill 6+2 Discharge 0+2 Pressure 90

South well flow setting: F North well flow setting: F

COMPRESSOR CHECKS: Hours 1346 Temperature 140 Oil N/Clear

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in. South system: 90 in. Blower: 31 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 1-1.5 GPM South Trench: 1-1.5 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: _____ GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10 / 20 50 % South: 10 / 20 50 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units:_____ South Units:_____ 2,000 Gal. Unit _____

CULTURE OBSERVATIONS:

DOURs: [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. ~~47~~ cancelled TPH/TEH: ✓ BTXE: ___ Comment: S Influent

Sample No. 48 TPH/TEH: ✓ BTXE: ___ Comment: N Influent

OPERATIONAL CHANGES TODAY:

Started Well Pumps N/S at 12:00

Load Formed 600 gal

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: RJC

DATE: 5-24 TIME: 1000 AM HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill 8+2 Discharge 0+2 Pressure 80

East well flow setting: F West well flow setting: F

NORTH TRENCH: Refill 8 Discharge 0+2 Pressure 80

South well flow setting: F North well flow setting: F

COMPRESSOR CHECKS: Hours 1360 Temperature 142 Oil N/C/Leak

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 80 in. South system: 80 in. Blower: 80 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 1 to 1½ GPM South Trench: ½ to 1 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 2 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10 / 20 50 ½ % South: 10 / 20 66 ⅔ %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units:_____ South Units:_____ 2,000 Gal. Unit _____

CULTURE OBSERVATIONS: Water Temperature: ____ Deg.C.

DOURs: [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No._____ TRH/TEH:___ BTXE:___ Comment:_____

Sample No._____ TPH/TEH:___ BTXE:___ Comment:_____

OPERATIONAL CHANGES TODAY:

Increased N well Rate

Boss
000
yfine

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: DJC / RVW at 8:00 PM to sample beginning effluent

DATE: 5-25 TIME: 1100 AM HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill 1+2 Discharge 0+2 Pressure 20

East well flow setting: F West well flow setting: F

NORTH TRENCH: Refill 1 Discharge 0+2 Pressure 20

South well flow setting: F North well flow setting: F

COMPRESSOR CHECKS: Hours 1322 Temperature 140 Oil N/C clear

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in. South system: 80 in. Blower: 81 in.
82" 8 PM Temp=130°

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 1 to 1½ GPM South Trench: ½ to 1 GPM
8 gpm ↳ combined flow ~ 2 gpm North system ← wet flow South system = 0,4 gpm after

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 2 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10/10 _____ % South: 10/10 _____ %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 5/17 South Units: 5/17 2,000 Gal. Unit 5/24

South trench restart 5/25

CULTURE OBSERVATIONS:

DOURs: [NH4]: [PO4]:

Trying to blend North water to South at 3:1 or 4:1 ratio

RVW 8 PM North system flow total wastewater

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. E47 TPH/TEH: ✓ BTXE: ✓ Comment: 2000 gal tank - just

Sample No. _____ TPH/TEH: ___ BTXE: ___ Comment: _____

OPERATIONAL CHANGES TODAY:

Spiked S Bio 1+2 with .4 Lt. Unloaded Gas (87 Oct)

Replace SE Hose + Re-adjusted water flow gpm to 0.4 gpm South ~2.5-3 gpm North

Still some dark foam in HT / Unload water

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: DV

DATE: 5/25 TIME: _____ HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill ____ Discharge _____ Pressure _____

East well flow setting: _____ West well flow setting: _____

NORTH TRENCH: Refill ____ Discharge _____ Pressure _____

South well flow setting: _____ North well flow setting: _____

COMPRESSOR CHECKS: Hours _____ Temperature _____ Oil ____

Air Filter drain checks: 1) _____ 2) _____ 3) _____

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: ___ in. South system: ___ in. Blower: 83 in. a little high

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: _____ GPM South Trench: _____ GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: _____ GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: ____/____ _____% South: ____/____ _____%

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 5/17 South Units: 1 ea 2,000 Gal. Unit 5/24

CULTURE OBSERVATIONS: 2lb today

DOURs: [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. E-50 TPH/TEH: ✓ BTXE: ✓ Comment: 2000gal effluent 24hr

Sample No. I-51 TPH/TEH: ✓ BTXE: ✓ Comment: INFLUENT after flow started at N Bar (Combined N/S trenches) at ~3 gpm 2.5N + 0.45

OPERATIONAL CHANGES TODAY:

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GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: J PHumphrice

DATE: 5/26 TIME: 12:45 HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill ____ Discharge _____ Pressure _____

East well flow setting: _____ West well flow setting: _____

NORTH TRENCH: Refill ____ Discharge _____ Pressure _____

South well flow setting: _____ North well flow setting: _____

COMPRESSOR CHECKS: Hours 1403 Temperature 140 Oil 120', ok

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 83 in. South system: 82 in. Blower: 84 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North ~~Trench~~ Clarifier: 2 GPM * South ~~Trench~~ Clarifier: ~~1/2~~ 1/3 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 2 GPM at sewer

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10 / 20 20 % South: 10 / 20 50 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: _____ South Units: _____ 2,000 Gal. Unit _____

CULTURE OBSERVATIONS:

DOURs: ~~not~~ checked [NH4]: Effluent 5 10ppm [PO4]: Effluent 5 ppm

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. I-48 TPH/TEH: ✓ BTXE: ✓ Comment: Influent to north skimmer

Sample No. E-49 TPH/TEH: ✓ BTXE: ✓ Comment: Effluent to sewer

OPERATIONAL CHANGES TODAY:

1 incl oil on both separators - try to skim today

Oil on both sides of skimmer sheet.

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: RVW

DATE: 5/27 TIME: 8 AM HIGH TIDE: ______

~1" free product North
~1/2" on south before drain

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill ~~3/4~~ A + 1/3 Discharge ~~A + 1/3~~ 3/4 A Pressure 80/6

East well flow setting: 3/4 full West well flow setting: 1/2 full

NORTH TRENCH: Refill B Discharge 3/4 A Pressure 82/5 Every 9 1/2 sec

Running well today

South well flow setting: full North well flow setting: full

COMPRESSOR CHECKS: Hours 1422 Temperature ✓ 130° Oil ✓ good

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS: still not too warm

North system: 82 in. South system: 81 in. Blower: 83 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North ~~Trench~~ clarifier: 0.4 GPM (Δ to 1.0 gpm) South ~~Trench~~ clarifier: 2.5 GPM

See sheen on North bioreactor 1 but clean on #2 → get viscous influent + free product

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: ~3.0 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10 / 10 15 % South: 10 / 10 80 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 5/17 South Units: 5/23 2,000 Gal. Unit 5/24

CULTURE OBSERVATIONS: All bioreactors look good, but lots of v. dark foam in South system, holding tank + North #1

DOURs: [NH4]: [PO4]:

Free product oil on both clarifiers → see some getting through to North #1, so slowed down

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. E-50 TPH/TEH: ✓ BTXE: ✓ Comment: 3 gpm flow - before turning down

Sample No.____ TPH/TEH:___ BTXE:___ Comment: ______

Opened valve at South system to 1/4 more flow thru

OPERATIONAL CHANGES TODAY: Turn down flowrate at south trench to give ~ 2 gpm total (when North system is on); skimmed free product on both clarifiers. Aprox — gal N, — gal S free oil. Pure oil recovered! Set South Trench to B Refill / 3/4 A discharge to slow down every 5 sec. North trench left on

(Left margin:) North trench clearly pumping to dry; then North trench stops pumping too — controller turns off for 1-3 min every 10-15 min (sometimes after 3 min)

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: Steve JPH

DATE: 5/28/89 TIME: 11:25AM HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill ___ Discharge ___ Pressure ___

East well flow setting: _____ West well flow setting: _____

NORTH TRENCH: Refill ___ Discharge ___ Pressure ___

South well flow setting: _____ North well flow setting: _____

COMPRESSOR CHECKS: Hours 1450 Temperature 130° Oil Surface foam

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 84 in. South system: 84 in. Blower: 84 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North ~~Trench~~ Separator: 2 GPM South ~~Trench~~ septa: ✓ GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 1.3 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 20/10 10 % South: 20/10 25 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units:_____ South Units:_____ 2,000 Gal. Unit _____

CULTURE OBSERVATIONS:

DOURs: [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. E-5 TPH/TEH: ✓ BTXE: ✓ Comment: Effluent 200 gal

Sample No._____ TPH/TEH:___ BTXE:___ Comment:_____

OPERATIONAL CHANGES TODAY:

NS pump off, No flow to S clarifier. S system alternate on/off.

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: DGO

DATE: 5-29-95 TIME: 1500 HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill B Discharge 0+2 Pressure 80

East well flow setting: F West well flow setting: F

NORTH TRENCH: Refill B Discharge 0+2 Pressure 80

South well flow setting: OFF North well flow setting: F

COMPRESSOR CHECKS: Hours 1477 Temperature 120 Oil N

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 82 in. South system: 81 in. Blower: 87 in.

→ Blew out aerators today at ~ 5psi + on south
↳ was at 84" → brought down to 81"

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 1.5-2 GPM South Trench: 1.5-2 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 3-4 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 20 / 10 50 % South: 20 / 10 65 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: _____ South Units: _____ 2,000 Gal. Unit _____

CULTURE OBSERVATIONS: SW - lots of foam - no free product except a little in foam

DOURs: little foam in North on Kodak Tank [NH4]: as per last 2 weeks [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. E-52 TPH/TEH: ✓ BTXE: ✓ Comment: North + South ow

Sample No. _____ TPH/TEH: ___ BTXE: ___ Comment: _____

OPERATIONAL CHANGES TODAY:

Skimmed N Clarifier, Os Connected NS well

↳ 3-5 gals oil collected

↳ waiting for replacement pressure valve from QED

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: RDU

DATE: 31 May TIME: 2:00 pm HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill B Discharge 07 2 Pressure 80

East well flow setting: 1/2 West well flow setting: Full

NORTH TRENCH: Refill B Discharge 07 4 Pressure _____

South well flow setting: OFF North well flow setting: Full

COMPRESSOR CHECKS: Hours 1525 Temperature 130 Oil N

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 81 in., South system: 81 in. Blower: 81 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 1.5 GPM South Trench: 1.5 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 3.0 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10 / 20 100 % South: 10 / 200 85 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units: 31 May South Units: 31 May 2,000 Gal. Unit 31 May

CULTURE OBSERVATIONS:

DOURs: [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No._____ TPH/TEH:___ BTXE:___ Comment:_____

Sample No._____ TPH/TEH:___ BTXE:___ Comment:_____

OPERATIONAL CHANGES TODAY:

CytoCulture International, Inc.

GROUNDWATER TREATMENT DAILY FACILITY INSPECTION LOG

P.I.E. NATIONWIDE BIOREMEDIATION SITE, EMERYVILLE, CA

OPERATOR: DJC

DATE: 30 May TIME: 4:1m HIGH TIDE: _____

WELL PUMP CONTROLLER SETTINGS AND OBSERVATIONS:

SOUTH TRENCH: Refill 6 Discharge 0+2 Pressure 80

East well flow setting: 1/2 West well flow setting: Full

NORTH TRENCH: Refill 6 Discharge 0+2 Pressure ____

South well flow setting: OFF North well flow setting: Full

COMPRESSOR CHECKS: Hours 1501 Temperature 130 Oil N

Air Filter drain checks: 1) ✓ 2) ✓ 3) ✓

BLOWER AIR PRESSURE READINGS and TEMPERATURE CHECKS:

North system: 91 in. South system: 81 in. Blower: 92 in.

GROUNDWATER EXTRACTION TRENCH FLOW RATES:

North Trench: 1.5 GPM South Trench: 1.5 GPM

TOTAL GROUNDWATER TREATMENT DISCHARGE RATE: 3 GPM

DIAMMONIUM PHOSPHATE FLOW AND PERCENT REMAINING:

North: 10 / 20 100 % South: 10 / 20 55 %

DATE OF LAST BIOSOCK INOCULATIONS: (# per unit)

North Units:_____ South Units:_____ 2,000 Gal. Unit _____

CULTURE OBSERVATIONS:

DOURs: [NH4]: [PO4]:

SAMPLES TAKEN AND TESTS REQUESTED FOR ANALYSIS:

Sample No. E-S3 TPH/TEH: ✓ BTXE: ✓ Comment: 2000 at 3gpm

Sample No. I-S4 TPH/TEH: ✓ BTXE: ✓ Comment: South Well at 1.5 GPM

OPERATIONAL CHANGES TODAY:

Refilled N Nutrient tank

Skimmed free product