



GeoStrategies Inc.

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January 19, 1993

Mr. Richard Hiatt  
Regional Water Quality Control Board  
San Francisco Bay Region  
2101 Webster Street, Suite 500  
Oakland, California 94612

(Certified Mail)

Subject: Remediation Schedules for ARCO Sites in Alameda County,  
California

Dear Mr. Heitt:

On behalf of ARCO Products Company (ARCO), and as requested in the meeting held on November 19, 1992 at the Alameda County Health Care Services Agency (ACHCSA), GeoStrategies Inc. (GSI) has revised the Remediation Implementation schedules for remediation of sites under your regulatory oversight.

The darkened lines on the schedules represent deadlines which were agreed upon during the November 19, 1992 meeting. The hatched lines represent our best guess estimates of times which may be required to complete tasks should unforeseen delays occur. These unforeseen delays include permitting issues, offsite access issues, and estimated times of operation of the respective remediation systems.

:ARCOMISC\7926RTL.LTR(kjj)

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**GeoStrategies Inc.**

Regional Water Quality Control Board  
January 19, 1993  
Page 2

If you have any questions or comments, please contact us at (510) 352-4800  
or Mr. Michael Whelan of ARCO at (415) 571-2449.

Sincerely,



John F. Vargas  
Project Manager

cc: Ms. Susan Hugo, ACHA (Certified Mail)  
Mr. Michael Whelan, ARCO  
Mr. John Meck, ARCO Legal  
Mr. H.C. Winsor, ARCO  
Mr. Mark Thomson, Alameda County DA (without attachments)

# PROJECT TIME LINE

ACTIVITY		1992												1993												
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
SOIL INVESTIGATION (1)		■																								COMPLETED OCT, 1991
ADDITIONAL GROUNDWATER INVESTIGATION (2)		■																								COMPLETED 8-27-92
GROUNDWATER	REMEDIATION SYSTEM DESIGN (3)	■																								COMPLETED SEPT, 1992
	SYSTEM PERMITTING (4)	■																								RECEIVED 1/15/93
	EQUIPMENT PROCUREMENT (5)																									COMPLETED
	SYSTEM CONSTRUCTION AND START-UP (6)																									START-UP 1/15/93
	SYSTEM OPERATION AND MAINTENANCE (7)													▨												JAN, 1998
	PERFORMANCE EVALUATION (8)													■												
	REMEDIATION SYSTEM DESIGN (9)	■																								COMPLETED SEPT, 1992
SOIL	SYSTEM PERMITTING (10)	■																								COMPLETED
	EQUIPMENT PROCUREMENT (11)	■																								COMPLETED
	SYSTEM CONSTRUCTION AND START-UP (12)	■																								ANTICIPATED COMP. 12-18-92
	SYSTEM OPERATION AND MAINTENANCE (13)													▨												
	VERIFICATION SOIL BORINGS (14)													▨												JAN-MAR, 1994
VERIFICATION GROUNDWATER MONITORING (15)														▨												FEB, 1998-JAN, 1999
SITE CLOSURE (SOIL AND GROUNDWATER) (16)														▨												FEB, 1999-JAN, 2000

## LEGEND

(X) FOR NOTES AND ASSUMPTIONS REFER TO PLATES 2, 3 AND 4

■ PROBABLE SCHEDULE

▨ ESTIMATED SCHEDULE



GeoStrategies Inc.

### REMEDIATION IMPLEMENTATION SCHEDULE

ARCO Service Station #2112  
1260 Park Street  
Alameda, California

PLATE

**1**

JOB NUMBER  
7920-RTL

REVIEWED BY

DATE  
1/92

REVISED DATE  
1/93

**(1) Soil Investigation**

- Soil contamination is on-site only and has been delineated by already completed work

**(2) Additional Ground-water Investigation**

- Ground-water investigation has been completed (GSI, September 25, 1992).
- Ground-water contamination was delineated upon completion of the activities proposed in the work plan.
- Field work, data evaluation, and reporting was completed on September 29, 1992.

**(3) Remediation System Design (Ground-water)**

- Ground-water remediation will only be required onsite.
- A Remedial Action Plan (RAP) was submitted on September 27, 1992 detailing the design of the on-site ground-water remediation system.

**(4) Remediation System Permitting (Ground-water)**

- Modifications to design were required for permitting.
- Planning/Building department approval was obtained on September 30, 1992.
- Discharge permit approval was obtained on July 14, 1992. The permit was issued January 5, 1993.

**(5) Equipment Procurement (Ground-water)**

- No equipment modification due to agency/permitting requirements.
- System equipment has been received.



GeoStrategies Inc.

**REMEDATION IMPLEMENTATION SCHEDULE**

ARCO Service Station #2112  
1260 Park Street  
Alameda, California

PLATE

**2**

JOB NUMBER  
7920-RTL

REVIEWED BY

DATE  
1/92

REVISED DATE  
1/93

**(6) System Construction and Startup (Ground-water)**

- System construction was started on October 19, 1992.
- System equipment installation is scheduled for completion on December 18, 1992.
- Startup originally scheduled for February 1, 1993, and was performed on January 5, 1993.

**(7) System Operation and Maintenance (Ground-water)**

- Five year operation of system to meet cleanup levels.
- Regulatory approval of system shutdown after five years.

**(8) Performance Evaluation (Ground-water)**

- Will show system is operating as designed and does not require modification.

**(9) Remediation System Design (Soil)**

- Soil remediation will only be required on-site.
- A RAP was prepared detailing the design of the on-site soil remediation system and was submitted September 27, 1992.
- No revisions were required following agency review.

**(10) System Permitting (Soil)**

- No modifications to design required for permitting
- BAAQMD permit was issued August 10, 1992.
- Building/Planning department approval was obtained September 30, 1992.



GeoStrategies Inc.

**REMEDATION IMPLEMENTATION SCHEDULE**

ARCO Service Station #2112  
1260 Park Street  
Alameda, California

PLATE

**3**

JOB NUMBER  
7920-RTL

REVIEWED BY

DATE  
1/92

REVISED DATE  
1/93

(11) Equipment Procurement (Soil)

- No special equipment modification due to agency/permitting requirements.
- System equipment has been received.

(12) System Construction and Startup (Soil)

- System construction was started on October 19, 1992.
- System equipment installation is scheduled for completion on December 18, 1992.
- Startup is scheduled for December 21, 1992.

(13) System Operation and Maintenance (Soil)

- One year operation of system to meet cleanup levels.
- Regulatory approval of system shutdown after one year.

(14) Verification Soil Borings

- Borings demonstrate soil cleanup has been achieved - no further system operation.

(15) Verification Monitoring

- One year (four quarters) of monitoring water-levels and sampling.
- Sampling demonstrates ground-water cleanup has been achieved. No further system operation required.

(16) Site Closure

- Agency approval based on results of verification borings, monitoring and sampling.



GeoStrategies Inc.

REMEDATION IMPLEMENTATION SCHEDULE

ARCO Service Station #2112  
1260 Park Street  
Alameda, California

PLATE

4

JOB NUMBER  
7920-RTL

REVIEWED BY

DATE  
1/92

REVISED DATE  
12/92

# PROJECT TIME LINE

ACTIVITY		1992												1993																				
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D									
TANK REPLACEMENT	(1)	██████████																						COMPLETED MAR, 1992										
ADDITIONAL SOIL INVESTIGATION	(2)	██████████																						COMPLETED OCT, 1992										
GROUNDWATER INVESTIGATION	(3)	██████████												▨▨▨▨																			ON SITE, COMPLETED OCT, 1992	
GROUNDWATER	REMEDIATION SYSTEM DESIGN	(4)												██████████																				
	SYSTEM PERMITTING	(5)												██████████																				
	EQUIPMENT PROCUREMENT	(6)												██████████																				
	SYSTEM CONSTRUCTION AND START-UP	(7)												██████████																				
	SYSTEM OPERATION AND MAINTENANCE	(8)																								▨▨▨▨			SEPT, 1998					
	PERFORMANCE EVALUATION	(9)																								██████████		JAN, 1994						
SOIL	REMEDIATION SYSTEM DESIGN	(10)												██████████																				
	SYSTEM PERMITTING	(11)												██████████																				
	EQUIPMENT PROCUREMENT	(12)												██████████																				
	SYSTEM CONSTRUCTION AND START-UP	(13)												██████████																				
	SYSTEM OPERATION AND MAINTENANCE	(14)																								▨▨▨▨			SEPT, 1994					
VERIFICATION SOIL BORINGS	(15)																								▨▨▨▨		SEPT-NOV, 1994							
VERIFICATION GROUNDWATER MONITORING	(16)																								▨▨▨▨			SEPT, 1998-APR, 1999						
SITE CLOSURE (SOIL AND GROUNDWATER)	(17)																								▨▨▨▨			SEPT, 1999-AUG, 2000						

## LEGEND

(X) FOR NOTES AND ASSUMPTIONS REFER TO PLATES 2 THROUGH 5.

██████████ PROBABLE SCHEDULE

▨▨▨▨ ESTIMATED SCHEDULE



GeoStrategies Inc.

REMEDIATION IMPLEMENTATION SCHEDULE  
 ARCO Service Station #2169  
 889 West Grand Avenue  
 Oakland, California

PLATE

1

JOB NUMBER  
7927-RTL

REVIEWED BY

DATE  
1/92

REVISED DATE  
1/93

**(1) Tank Replacement**

- Tank replacement was completed in March 1992 (Roux report).
- All stockpiled soil was aerated and removed from the site during March 1992.

**(2) Additional Soil Investigation**

- Soil contamination is on-site only.
- Soil contamination is delineated by completion of the activities proposed in the work plan.
- Field work, data evaluation, and reporting of the soil investigation was completed on November 24, 1992.

**(3) Ground-water Investigation**

- The work plan for on-site assessment has been submitted to the Alameda County Health Agency.
- Field work, data evaluation, and reporting of the ground-water investigation phase was completed on November 24, 1992. Field work included installation of ground-water monitoring and extraction wells, vapor extraction wells, aquifer test and vapor extraction test.
- Additional work will be required off-site to complete ground-water delineation.
- A second work plan will be prepared for an off-site ground-water investigation.
- The second work plan will be approved by the Alameda County Health Agency within one month after submittal.
- Ground-water contamination will be delineated after completion of the activities proposed in the second work plan.
- It will take approximately four months to obtain a City of Oakland Public Works Agency Encroachment Permit.
- Field work, data evaluation, and reporting of the ground-water investigation phase will require approximately two months to complete after issuance of applicable permits.



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**REMEDIAL IMPLEMENTATION SCHEDULE**

ARCO Service Station #2169  
889 West Grand Avenue  
Oakland, California

PLATE

**2**

JOB NUMBER  
7927-RTL

REVIEWED BY

DATE  
1/92

REVISED DATE  
12/92



**(4) Remediation System Design (Ground-water)**

- The tank replacement project will be completed by March 1992.
- Ground-water remediation will only be required onsite.
- A Remedial Action Plan (RAP) will be prepared detailing the design of the on-site ground-water remediation system.
- The RAP will be approved by the Alameda County Health Agency within one month of submittal.
- No revisions will be required following agency review.

**(5) Remediation System Permitting (Ground-water)**

- No modifications to design required for permitting.
- Planning/Building department approval within 120 days.
- BAAQMD permit within 90 days.
- Discharge permit approval within 90 days.

**(6) Equipment Procurement (Ground-water)**

- No equipment modification due to agency/permitting requirements.
- Equipment available from manufacturers stock within six weeks.



GeoStrategies Inc.

**REMEDATION IMPLEMENTATION SCHEDULE**

ARCO Service Station #2169  
889 West Grand Avenue  
Oakland, California

PLATE

**3**

JOB NUMBER  
7927-RTL

REVIEWED BY

DATE  
1/92

REVISED DATE  
12/92

**(7) System Construction and Startup (Ground-water)**

- No delays due to underground storage tank replacement.
- No delays from utility companies.
- No special dealer/property owner requirements.
- No unusual contractor delays.
- No unforeseen on-site conditions.
- No weather delays.
- This task includes bid process, bid evaluation, contract completion and system construction.

**(8) System Operation and Maintenance (Ground-water)**

- Five year operation of system to meet cleanup levels.
- Regulatory approval of system shutdown after five years.

**(9) Performance Evaluation (Ground-water)**

- Will show system is operating as designed and does not require modification.

**(10) Remediation System Design (Soil)**

- The tank replacement project will be completed by March 1992.
- Soil remediation will only be required on-site only.
- A RAP will be prepared detailing the design of the on-site soil remediation system.
- The RAP will be approved by the Alameda County Health Care Services Agency within one month of submittal.
- Soil vapor extraction is a feasible remediation method.
- No revisions due to agency review.



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**REMEDATION IMPLEMENTATION SCHEDULE**

ARCO Service Station #2169  
889 West Grand Avenue  
Oakland, California

PLATE

**4**

JOB NUMBER  
7927-RTL

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DATE  
1/92

REVISED DATE  
1/93

**(11) System Permitting (Soil)**

- No modifications to system design required for permitting.
- BAAQMD approval within 120 days
- Building/Planning department approval within 120 days.

**(12) Equipment Procurement (Soil)**

- No special agency requirements.
- Available from manufacturer stock within eight weeks.

**(13) System Construction and Startup (Soil)**

- No delays due to underground storage tank replacement.
- No delays from utility companies.
- No special dealer/property owner requirements.
- No unusual contractor delays.
- No unforeseen on-site conditions.
- No weather delays.

**(14) System Operation and Maintenance (Soil)**

- One year operation of system to meet cleanup levels.
- Regulatory approval of system shutdown after one year.



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REMEDICATION IMPLEMENTATION SCHEDULE  
ARCO Service Station #2169  
889 West Grand Avenue  
Oakland, California

PLATE

**5**

JOB NUMBER  
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DATE  
1/92

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12/92

**(15) Verification Borings**

- Borings demonstrate soil cleanup has been achieved - no further system operation.

**(16) Verification Monitoring**

- One year (four quarters) of monitoring water-levels and sampling.
- Sampling demonstrates ground-water cleanup has been achieved. No further system operation required.

**(16) Site Closure**

- Agency approval based on results of verification borings, monitoring and sampling.



GeoStrategies Inc.

REMEDICATION IMPLEMENTATION SCHEDULE  
ARCO Service Station #2169  
889 West Grand Avenue  
Oakland, California

PLATE

**6**

JOB NUMBER  
7927-RTL

REVIEWED BY

DATE  
1/92

REVISED DATE  
12/92

# PROJECT TIME LINE

ACTIVITY	1992												1993																							
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D												
TANK REPLACEMENT (1)																									COMPLETED JUNE, 1992											
ADDITIONAL SOIL INVESTIGATION (2)																																				
ADDITIONAL GROUNDWATER INVESTIGATION (3)																																				
GROUNDWATER	REMEDIATION SYSTEM DESIGN (4)																																			
	SYSTEM PERMITTING (5)																																			
	EQUIPMENT PROCUREMENT (6)																																			
	SYSTEM CONSTRUCTION AND START-UP (7)																														COMPLETED 11-13-92					
	SYSTEM OPERATION AND MAINTENANCE (8)																																			NOV., 1997
	PERFORMANCE EVALUATION (9)																																			START-UP 11-13-92
	VERIFICATION GROUNDWATER MONITORING (10)																																			NOV., 1997-OCT., 1998
SITE CLOSURE (SOIL AND GROUNDWATER) (11)																																			NOV., 1998-OCT., 1999	

## LEGEND

(X) FOR NOTES AND ASSUMPTIONS  
REFER TO PLATES 2, 3 AND 4

PROBABLE SCHEDULE

ESTIMATED SCHEDULE



GeoStrategies Inc.

REMEDIATION IMPLEMENTATION SCHEDULE  
 ARCO Service Station #4931  
 731 West MacArthur Boulevard  
 Oakland, California

PLATE

1

JOB NUMBER  
7909-RTL

REVIEWED BY

DATE  
1/92

REVISED DATE  
1/93

**(1) Tank Replacement**

- Tank replacement was completed in June 1992.
- All stockpiled soil was aerated and removed from the site in June 1992.

**(2) Additional Soil Investigation**

- Soil contamination is on-site only.
- Soil contamination was removed primarily during the tank replacement project.
- Field work, data evaluation, and reporting of the soil investigation was completed in October 1992.

**(3) Additional Ground-water Investigation**

- The work plan was prepared for the installation of one off-site monitoring well and two on-site recovery wells.
- The work plan was approved by the Alameda County Health Care Services Agency within one month of submittal
- Ground-water contamination was delineated upon completion of the activities proposed in the work plan.
- City of Oakland Public Works Agency Encroachment Permit issued June 1, 1992.
- Additional on-site recovery wells were installed June 15 and 16, 1992.
- Field work, data evaluation, and reporting of the ground-water investigation phase was completed on November 13, 1992.
- Field work was completed in June 1992.



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**REMEDATION IMPLEMENTATION SCHEDULE**

ARCO Service Station #4931  
731 West MacArthur Boulevard  
Oakland, California

PLATE

**2**

JOB NUMBER  
7909-RTL

REVIEWED BY

DATE  
1/92

REVISED DATE  
12/92

**(4) Remediation System Design (Ground-water)**

- Ground-water remediation will only be required onsite.
- The already completed design will be approved by the Alameda County Health Care Services Agency within one month of submittal.
- No revisions will be required following agency review.

**(5) System Permitting (Ground-water)**

- Discharge permit will be issued in 60 days.
- BAAQMD permit will be issued in 60 days.
- Planning/Building department approval will be issued in 120 days.
- No modifications to design required for permitting.

**(6) Equipment Procurement (Ground-water)**

- No equipment modification due to agency/permitting requirements.
- Equipment available from manufacturers stock within six weeks.



GeoStrategies Inc.

**REMEDICATION IMPLEMENTATION SCHEDULE**

ARCO Service Station #4931  
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Oakland, California

PLATE

**3**

JOB NUMBER  
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DATE  
1/92

REVISED DATE  
12/92

(7) **System Construction and Startup (Ground-water)**

- The recovery system construction and installation was completed in November 1992.
- Startup of the system was performed on November 13, 1992.

(8) **System Operation and Maintenance (Ground-water)**

- Five year operation of system to meet cleanup levels.
- Regulatory approval of system shutdown after five years.

(9) **Performance Evaluation (Ground-water)**

- Will show system is operating as designed and does not require modification.

(10) **Remediation System Design (Soil)**

- The tank replacement project was completed in June 1992.
- Soil remediation was performed by overexcavation during the tank replacement project.

(11) **Verification Ground-water Monitoring**

- One year length.
- Sampling demonstrates ground-water cleanup has been achieved. No further system operation required.

(12) **Site Closure**

- Agency approval based on results of verification borings, monitoring and sampling.



GeoStrategies Inc.

**REMEDIAL IMPLEMENTATION SCHEDULE**

ARCO Service Station #4931  
731 West MacArthur Boulevard  
Oakland, California

PLATE

**4**

JOB NUMBER  
7909-RTL

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DATE  
1/92

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12/92