QUARTERLY GROUNDWATER REPORT

5800 CHRISTIE AVENUE, EMERYVILLE, CALIFORNIA

OCTOBER 31, 1991

SUBMITTED TO:

MR. DENNIS BYRNE
ALAMEDA COUNTY HEALTH CARE SERVICES
HAZARDOUS MATERIALS DIVISION
80 SWAN WAY, ROOM 200
OAKLAND, CALIFORNIA 94621

PREPARED FOR :

CROLEY & HERRING INVESTMENT COMPANY
448 THARP DRIVE,
MORAGA, CALIFORNIA 94556

PREPARED BY:

ETS

ENVIRONMENT & TECHNOLOGY SERVICES
638 BLAIR AVENUE,
PIEDMONT, CALIFORNIA 94611
TELEPHONE: 510-601-1263
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ETS

ENVIRONMENT & TECHNOLOGY SERVICES

638 BLAIR AVENUE, PIEDMONT, CALIFORNIA 94611
PHONE 510-601-1263 *FAX 510-601-1793*

October 31, 1991

Mr. Dick Herring
President
Croley & Herring Investment Company
448 Tharp Avenue,
Moraga, California 94556

Subject: **Quarterly Groundwater Report**
5800 Christie Avenue, Emeryville, California

Dear Mr. Herring:

Enclosed please find a copy of the quarterly groundwater report for the October, 1991 water sampling period at the subject facility.

Please contact me if you have any question about this report.

Sincerely,

Walter W. Loo, RG CEG
President

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1.0 INTRODUCTION

Environmental & Technology Services*(ETS)* was retained by Croley & Herring Investment Company to performed the 8th quarterly groundwater monitoring for the facility located at 5800 Christie Street in Emeryville, California. The subject facility is currently leased to an electronic merchandise retailer. Prior to leasing, soil contamination was identified at the subject facility. The contaminated soil was removed with the exception of those underlying a building because of safety concern. The removed soil was remediated on-site and properly disposed of with the approval of the regulatory agencies.

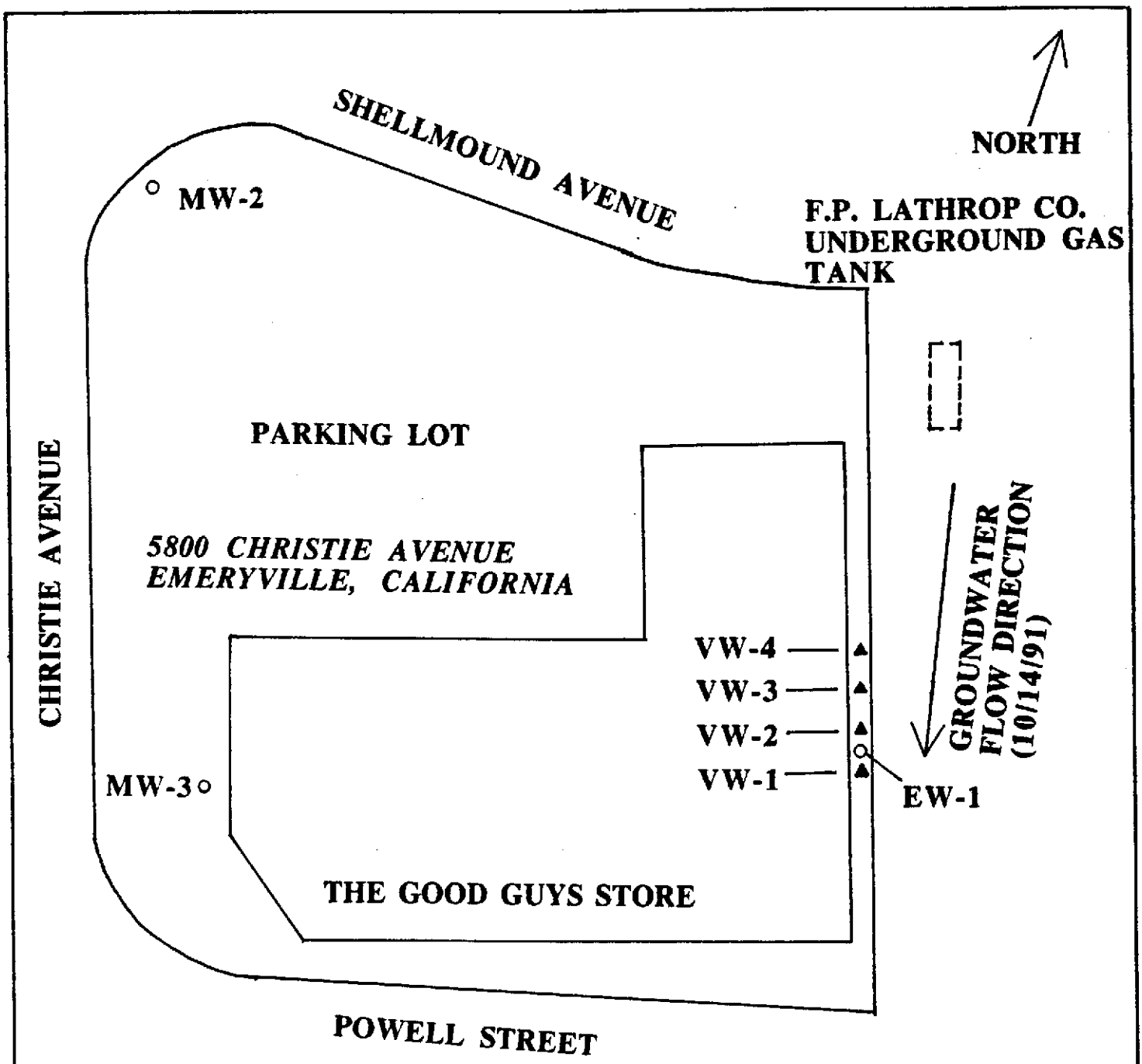
There is a vapor extraction system installed immediately adjacent to the northeastern side of the building to mitigate the residual volatile hydrocarbons contained in the soil. As part of the site closure plan, a quarterly groundwater monitoring program has been implemented. Previous quarterly monitoring events were conducted on November 6, 1989, February 20, 1990, May 31, 1990, September 7, 1990, December 4, 1990, April 16, 1991 and July 3,1991 respectively. This quarterly monitoring event was conducted on October 12, 1991. Water samples were taken from the monitoring wells and sent to a State-certified laboratory for analysis under proper chain-of-custody procedures.

This report presents the results of this quarterly groundwater monitoring event including groundwater movement analysis, laboratory analytical results, summary of findings, and conclusions and discussions.

2.0 GROUNDWATER MOVEMENT ANALYSIS

Prior to sample collection of this quarterly sampling, depth-to-water table in each of the three existing monitoring wells at the facility was measured for the analysis of groundwater movement. Table 1 presents a summary of the water levels in the three wells (EW-1, MW-2, and MW-3) from the groundwater monitoring events prepared by ETS.

From the result of the water level measurements on October 14, 1991, elevation of water levels were increased in the three wells, as compared to the data collected in July 1991. Nevertheless, the groundwater flow direction remained in the same direction, flowing towards south (Figure 1). The hydraulic gradient was 0.011 feet per horizontal foot.



ETS

ENVIRONMENT & TECHNOLOGY SERVICES

FIGURE 1

LOCATION MAP

TABLE 1

SUMMARY OF WATER LEVEL DATA

WELL Name	Elev. of TOC (Ft-MSL)	11/6/89 DTW Ft.	11/6/89 SWL Ft.	2/20/90 DTW Ft.	2/20/90 SWL Ft.	5/31/90 DTW Ft.	5/31/90 SWL Ft.	9/7/90 DTW Ft.	9/7/90 SWL Ft.
EW-1	8.62	6.15	2.47	5.93	2.69	5.86	2.76	6.30	2.32
MW-2	7.42	4.37	3.05	4.26	3.16	4.26	3.16	4.60	2.82
MW-3	6.42	5.10	1.32	5.42	1.00	4.93	1.49	5.15	1.17

WELL Name	12/4/90 DTW Ft.	12/4/90 SWL Ft.	4/16/91 DTW Ft.	4/16/91 SWL Ft.	7/3/91 DTW Ft.	7/3/91 SWL Ft.	10/14/91 DTW Ft.	10/14/91 SWL Ft.
EW-1	7.39	2.23	6.02	2.60	6.20	2.42	6.5	2.12
MW-2	4.67	2.75	4.31	3.11	4.52	2.9	3.92	3.5
MW-3	5.96	1.35	5.25	1.17	5.33	1.09	4.63	1.79

Note:

TOC top of casing
DTW depth to water table
SWL static water level above MSL
MSL mean sea level

3.0 GROUNDWATER QUALITY

On October 12, 1991, ETS field personnel visited the facility and collected water samples from each of the three monitoring wells for laboratory analysis. These groundwater samples were sent to a state-certified laoratory for analyses of halocarbons using EPA method 601, total petroleum hydrocarbons (TPH) as gasoline and gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA method 602.

From the results of the laboratory analysis (Appendix A), none of the water samples collected from wells MW-2, and MW-3 contain detectable concentration of the above analytes on this sampling event. however, water sample taken from well EW-1 contained some volatile organic compounds. The compounds detected in well EW-1 from the October 12, 1991sampling episode are presented in Table 2.

TABLE 2

SUMMARY OF QUARTERLY GROUNDWATER QUALITY RESULTS OF WELL EW-1
5800 CHRISTIE AVENUE,
EMERYVILLE, CALIFORNIA

CONCENTRATIONS IN MG/L

COMPOUNDS	5/8/89	11/6/89	2/20/90	5/31/90	9/7/90	12/4/90	4/6/91	7/3/91	10/11/91
TPH as GASOLINE	NA	0.74	12.0	24.0	25.0	ND	51.0	23.0	39.0
BENZENE	ND	0.18	1.3	0.056	1.1	ND	3.0	0.65	ND
TOLUENE	0.19	0.039	3.6	6.1	0.8	1700	12.0	8.7	1.1
XYLENES	0.17	0.067	0.047	0.14	0.042	ND	ND	ND	ND
ETHYLBENZENE	ND	0.0008	0.0071	0.017	ND	ND	ND	ND	ND
HALOCARBONS(TOX)	0.718	1.1861	4.701	6.876	6.661	3.762	10.6	6.49	2.794
TCE	0.64	0.720	1.1	0.83	0.49	0.13	1.3	0.13	0.73
1,1 DCE	0.078	0.0023	0.014	0.069	0.036	ND	ND	ND	ND
1,2 DCE	ND	0.35	2.5	0.11	2.4	0.4	3.7	2.0	0.62
1,1,1 TCA	ND	0.026	0.55	1.2	0.51	2.6	2.9	0.25	0.47
1,1 DCA	ND	0.034	0.46	1.9	1.3	1.3	1.8	2.0	0.63
1,2 DCA	ND	0.0048	0.034	0.033	0.053	ND	ND	ND	0.12
VINYL CHLORIDE	ND	0.029	ND	2.6	1.7	0.23	0.91	1.90	0.17
CHLOROETHANE	ND	ND	0.029	0.094	0.15	ND	ND	0.17	0.054
METHYLENE CHLORIDE	ND	ND	0.014	0.04	0.022	ND	ND	ND	ND
TOTAL VOCs	1.078	1.9261	16.701	30.876	31.661	11.162	61.6	29.49	41.794

NA NOT ANALYSED
ND NOT DETECTED OR BELOW DETECTION LIMITS
VOCs VOLATILE ORGANIC COMPOUNDS (TPH PLUS TOX)

4.0 SUMMARY OF FINDINGS

Groundwater movement across the facility remains in a similar pattern, as compared to the result from the previous sampling event. Data of flow direction and hydraulic gradient are summarized below:

Date	4/25/89	11/6/89	2/20/90	5/31/90	9/7/90	12/4/90
Flow Towards	SW	S	S	S	S	S
Gradient	0.0014	0.012	0.016	0.0125	0.0115	0.045

Date	4/16/91	7/3/91	10/14/91
Flow Towards	S	S	S
Gradient	0.014	0.013	0.011

Table 2 presents a summary of analytical results of well EW-1 in time series. The concentration of TOX detected in this quarterly sampling effort has declined significantly while the TPH as gasoline increased as compared to the previous quarterly sampling. There are several factors that affect the changes in the hydrocarbon concentration. These factors are variations in water table, chemical breakdown due to natural degradation, and unidentified off-site sources.

At present, an experiment is being tried to desorb the organic chemicals from the clayey material and oxidize them in places near well EW-1 by the application of direct electrical current flow in the subsurface without pumping the groundwater. To date, the experiment showed successful control of the flow of groundwater in the area and the total volatile organic compounds(VOCs) at one time has reached below 4 ppm due to the induced electrochemical reactions between electrodes. The degree of the effectiveness and success cannot be assessed at this time because the readings were interfered by the spreading of the upgradient gasoline plume.

APPENDIX A

GROUNDWATER LABORATORY ANALYSIS REPORT

C K Y incorporated
Environmental Services

Date: 10/25/91
N911002

CHIC
638 Blair Ave.
Piedmont, CA 94611

Attn: Mr. Walter Loo

Subject: Laboratory Report
Project:

Enclosed is the laboratory report for samples received on 10/11/91. The chain-of-custody forms were properly filled out. The data reported includes:

Method	No. of Analysis
M8015 (Gasoline)	5 Water
EPA 8010 (601)	5 Water
EPA 8020 (602)	5 Water

The results are summarized on six pages.

Please feel free to call if you have any questions concerning these results.

Sincerely,

Danny Hoang
Laboratory Director

3942 Valley Avenue, Suite F, Pleasanton, CA 94566 • Telephone 415-846-3188 • Fax: 415-846-3188

EPA METHODS - 601/602

CLIENT:	CHIC	**DATE REC'D:**	10/11/91
PROJECT:		**DATE ANALYZED:**	10/16/91
SAMPLE ID:	EW-1	**MATRIX TYPE:**	Water
CONTROL NO:	N911002-1		

PARAMETERS (601)	RESULTS (ug/L)	DETECTION LIMIT (ug/L)
Dichlorodifluoromethane	ND	50
Chloromethane	ND	50
Vinyl Chloride	170	50
Bromomethane	ND	50
Chloroethane	54	50
Trichlorofluoromethane	ND	10
1,1-Dichloroethene	ND	10
Methylene Chloride	ND	10
Trans-1,2-Dichloroethene	ND	10
1,1-Dichloroethane	630	10
Cis-1,2 Dichloroethene	620	10
Chloroform	ND	10
1,1,1-Trichloroethane	470	10
Carbon Tetrachloride	ND	10
1,2-Dichloroethane	120	10
Trichloroethene	730	10
1,2-Dichloropropane	ND	10
Bromodichloromethane	ND	10
2-Chloroethylvinylether	ND	10
Trans-1,3-Dichloropropene	ND	10
Cis-1,3-Dichloropropene	ND	10
1,1,2-Trichloroethane	ND	10
Tetrachloroethene	ND	10
Dibromochloromethane	ND	10
Chlorobenzene	ND	10
Bromoform	ND	10
1,1,2,2-Tetrachloroethane	ND	10
M-Dichlorobenzene	ND	10
P-Dichlorobenzene	ND	10
O-Dichlorobenzene	ND	10
PARAMETERS (602)		
Benzene	ND	10
Toluene	1100	10
Ethylbenzene	ND	10
Xylenes	ND	10

EPA METHODS - 601/602

CLIENT:	CHIC	**DATE REC'D:**	10/11/91
PROJECT:		**DATE ANALYZED:**	10/16/91
SAMPLE ID:	MW-2	**MATRIX TYPE:**	Water
CONTROL NO:	N911002-2		

PARAMETERS (601)	RESULTS (ug/L)	DETECTION LIMIT (ug/L)
Dichlorodifluoromethane	ND	50
Chloromethane	ND	50
Vinyl Chloride	ND	50
Bromomethane	ND	50
Chloroethane	ND	50
Trichlorofluoromethane	ND	10
1,1-Dichloroethene	ND	10
Methylene Chloride	ND	10
Trans-1,2-Dichloroethene	ND	10
1,1-Dichloroethane	ND	10
Cis-1,2 Dichloroethene	ND	10
Chloroform	ND	10
1,1,1-Trichloroethane	ND	10
Carbon Tetrachloride	ND	10
1,2-Dichloroethane	ND	10
Trichloroethene	ND	10
1,2-Dichloropropane	ND	10
Bromodichloromethane	ND	10
2-Chloroethylvinylether	ND	10
Trans-1,3-Dichloropropene	ND	10
Cis-1,3-Dichloropropene	ND	10
1,1,2-Trichloroethane	ND	10
Tetrachloroethene	ND	10
Dibromochloromethane	ND	10
Chlorobenzene	ND	10
Bromoform	ND	10
1,1,2,2-Tetrachloroethane	ND	10
M-Dichlorobenzene	ND	10
P-Dichlorobenzene	ND	10
O-Dichlorobenzene	ND	10
PARAMETERS (602)		
Benzene	ND	10
Toluene	ND	10
Ethylbenzene	ND	10
Xylenes	ND	10

EPA METHODS - 601/602

CLIENT:	CHIC	**DATE REC'D:**	10/11/91
PROJECT:		**DATE ANALYZED:**	10/16/91
SAMPLE ID:	MW-3	**MATRIX TYPE:**	Water
CONTROL NO:	N911002-3		

PARAMETERS (601)	RESULTS (ug/L)	DETECTION LIMIT (ug/L)
Dichlorodifluoromethane	ND	50
Chloromethane	ND	50
Vinyl Chloride	ND	50
Bromomethane	ND	50
Chloroethane	ND	50
Trichlorofluoromethane	ND	10
1,1-Dichloroethene	ND	10
Methylene Chloride	ND	10
Trans-1,2-Dichloroethene	ND	10
1,1-Dichloroethane	ND	10
Cis-1,2 Dichloroethene	ND	10
Chloroform	ND	10
1,1,1-Trichloroethane	ND	10
Carbon Tetrachloride	ND	10
1,2-Dichloroethane	ND	10
Trichloroethene	ND	10
1,2-Dichloropropane	ND	10
Bromodichloromethane	ND	10
2-Chloroethylvinylether	ND	10
Trans-1,3-Dichloropropene	ND	10
Cis-1,3-Dichloropropene	ND	10
1,1,2-Trichloroethane	ND	10
Tetrachloroethene	ND	10
Dibromochloromethane	ND	10
Chlorobenzene	ND	10
Bromoform	ND	10
1,1,2,2-Tetrachloroethane	ND	10
M-Dichlorobenzene	ND	10
P-Dichlorobenzene	ND	10
O-Dichlorobenzene	ND	10
PARAMETERS (602)		
Benzene	ND	10
Toluene	ND	10
Ethylbenzene	ND	10
Xylenes	ND	10

EPA METHODS - 601/602

CLIENT:	CHIC	**DATE REC'D:**	10/11/91
PROJECT:		**DATE ANALYZED:**	10/16/91
SAMPLE ID:	#2	**MATRIX TYPE:**	Water
CONTROL NO:	N911002-4		

PARAMETERS (601)	RESULTS (ug/L)	DETECTION LIMIT (ug/L)
Dichlorodifluoromethane	ND	50
Chloromethane	ND	50
Vinyl Chloride	ND	50
Bromomethane	ND	50
Chloroethane	ND	50
Trichlorofluoromethane	ND	10
1,1-Dichloroethene	ND	10
Methylene Chloride	ND	10
Trans-1,2-Dichloroethene	ND	10
1,1-Dichloroethane	840	10
Cis-1,2 Dichloroethene	550	10
Chloroform	ND	10
1,1,1-Trichloroethane	ND	10
Carbon Tetrachloride	ND	10
1,2-Dichloroethane	58	10
Trichloroethene	390	10
1,2-Dichloropropane	ND	10
Bromodichloromethane	ND	10
2-Chloroethylvinylether	ND	10
Trans-1,3-Dichloropropene	ND	10
Cis-1,3-Dichloropropene	ND	10
1,1,2-Trichloroethane	ND	10
Tetrachloroethene	ND	10
Dibromochloromethane	ND	10
Chlorobenzene	ND	10
Bromoform	ND	10
1,1,2,2-Tetrachloroethane	ND	10
M-Dichlorobenzene	ND	10
P-Dichlorobenzene	ND	10
O-Dichlorobenzene	ND	10
PARAMETERS (602)		
Benzene	120	10
Toluene	980	10
Ethylbenzene	ND	10
Xylenes	ND	10

CKY INC., ENVIRONMENTAL SERVICES, 3942 Valley Ave., Suite F, Pleasanton, CA 94566 • Tel: 415-846-3188 • FAX: 415-846-1236

911002

CHAIN OF CUSTODY RECORD
REQUEST FOR ANALYSIS

DATE: 10/11/91
PAGE 1 OF 1

CLIENT
NAME: CHIC
ADDRESS: 638 BLAIR AVE
PIEDMONT, CA. 94611
PHONE NO. 510-601-1263 FAX NO. 601-1793
PROJECT NAME:
SEND REPORT TO: WALTER LOO

CK

Clayton Environmental Consultants
2100 Main Ave
Torrance, Calif. 90501
Tel: 213-618-4889
Fax: 213-618-0818

5 DAYS

SAMPLER NAME SIGNATURE
WALTER LOO

TURN AROUND TIME
NORMAL
RUSH

SAMPLE NUMBER	SAMPLING DATE/TIME	PRESERVATIVE	CONTAINER SIZE/TYPE	SAMPLE DESCRIPTION WATER	SOIL	OTHER	ANALYSES REQUIRED: 418.1	Mod 15	8010,601	8021,602	8020,624	625	8270,625	CAM Metals
01 EW-1	10/11/91		40ML (4)	✓				✓	✓	✓				
02 MW-2	10/11/91		40ML (4)	✓				✓	✓	✓				
03 MW-3	10/11/91		40ML (4)	✓				✓	✓	✓				
04 #2	10/11/91		40ML (4)	✓				✓	✓	✓				
05 #3	10/11/91		40ML (4)	✓				✓	✓	✓				

COMMENTS:

Relinquished by: Signature	Date	Received by: Signature	Date	Relinquished by: Signature	Date	Received by: Signature	Date
	10/11/91		10/11/91				
Company: ETS	Time: 2:30PM	Company: CLAYTON	Time: 14:30	Company:	Time:	Company:	Time: