GROUNDWATER
TECHNOLOGY
Consulting Groundwater Geologists
A Division of Oil Recovery Systems, Inc.
5047 CLAYTON ROAD • CONCORD, CA 94521 • (415) 671-2387

February 14, 1985

John Randall
Chevron USA, Inc.
2 Anabel Lane, Suite 200
San Ramon, CA 94583

Re: Chevron/Mobil Project in Livermore, California

Dear Mr. Randall;

This letter is to keep you informed of progress at the Chevron Livermore site (see attached Project Update). Analysis of the carbon tank effluent indicates a hydrocarbon concentration less than 30 ppb. Permission to continue discharging this treated water has been obtained from Robert Samaniego of the California Regional Water Quality Control Board. Mr. Samaniego has requested a copy of the project update thru February 14, 1985 to keep informed of developments at the site.

As previously discussed with Cliff Harper, Groundwater Technology plans to install an air stripping system for the treatment of dissolved hydrocarbons in water pumped from the recovery well. The installation of the air stripping unit is scheduled for the end of March.

Groundwater Technology has conducted a cost comparison between the carbon filter system and an air stripping system. The tables and graphs used to make the comparison are attached. Based on capital cost alone, for a flow rate of 4 gpm and hydrocarbon concentration of 30 ppm, the air stripping system becomes more cost effective after a period of approximately twelve monthes. The most recent analysis of dissolved hydrocarbon concentration in the carbon tank influent is 50 ppm which will shorten the carbon bed life and thus increase the cost effectiveness of the Air Stripper unit. As noted the comparison does not include costs of installation, maintenance or rental of carbon tank.

February 14, 1985

Groundwater Technology will continue to keep Chevron informed of developments at the site by weekly phone reports. If you have any questions or comments please contact Cliff Harper or myself at the Concord Office.

Cordially,

Robert Juncal

Robert Juncal
Geologist

Rj/asj

Mobil Oil Corporation

612 SOUTH FLOWER STREET
P.O. BOX 2122
LOS ANGELES, CALIFORNIA 90051

January 29, 1985

Mr. Cliff Harper
Groundwater Technology
5047 Clayton Road
Concord, California 94521

CHEVRON/MOBIL
LIVERMORE, CALIFORNIA

Dear Cliff:

Our management has approved the installation of a recovery system on our service station at First Street, in Livermore. Please provide me an update as required on your progress towards recovering the Chevron product that is migrating toward our site. Any additional construction beyond your current proposal must be cleared through me.

Thank you,

R. J. Edwards
Region Environmental
Coordinator

RJE:ars
35930

PROJECT UPDATE

1. The recovery system is on line and has retrieved a total of 192 gallons to date.

2. The groundwater gradient map shows the cone of depression created by pumping within the recovery well.

3. The product thickness map indicates the extent of the free floating product plume.

4. Pumped groundwater is presently being treated by a carbon filter system before discharge into existing drainage.

5. Water sample analysis of the carbon tank influent (50 ppm) and effluent (30 ppb) for dissolved hydrocarbon concentration indicates the system is operating at 100% efficiency (analysis attached).

   Note: The effluent samples are taken directly from the carbon tank discharge line.

6. Groundwater Technology will continue to sample the carbon tank influent and effluent on a weekly basis to monitor degradation of the carbon bed.

7. At the present flow of 2 pgm and 50 ppm hydrocarbon concentration of carbon tank influent the carbon bed life is approximately 40 - 60 days.

8. Due to the cost effectiveness and equivalent efficency of hydrocarbon removal an air stripping system will be installed to replace the carbon filter system.

GROUNDWATER TECHNOLOGY
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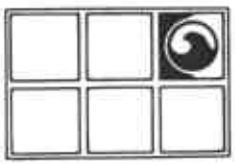
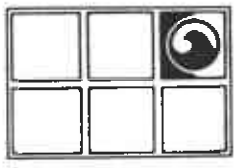


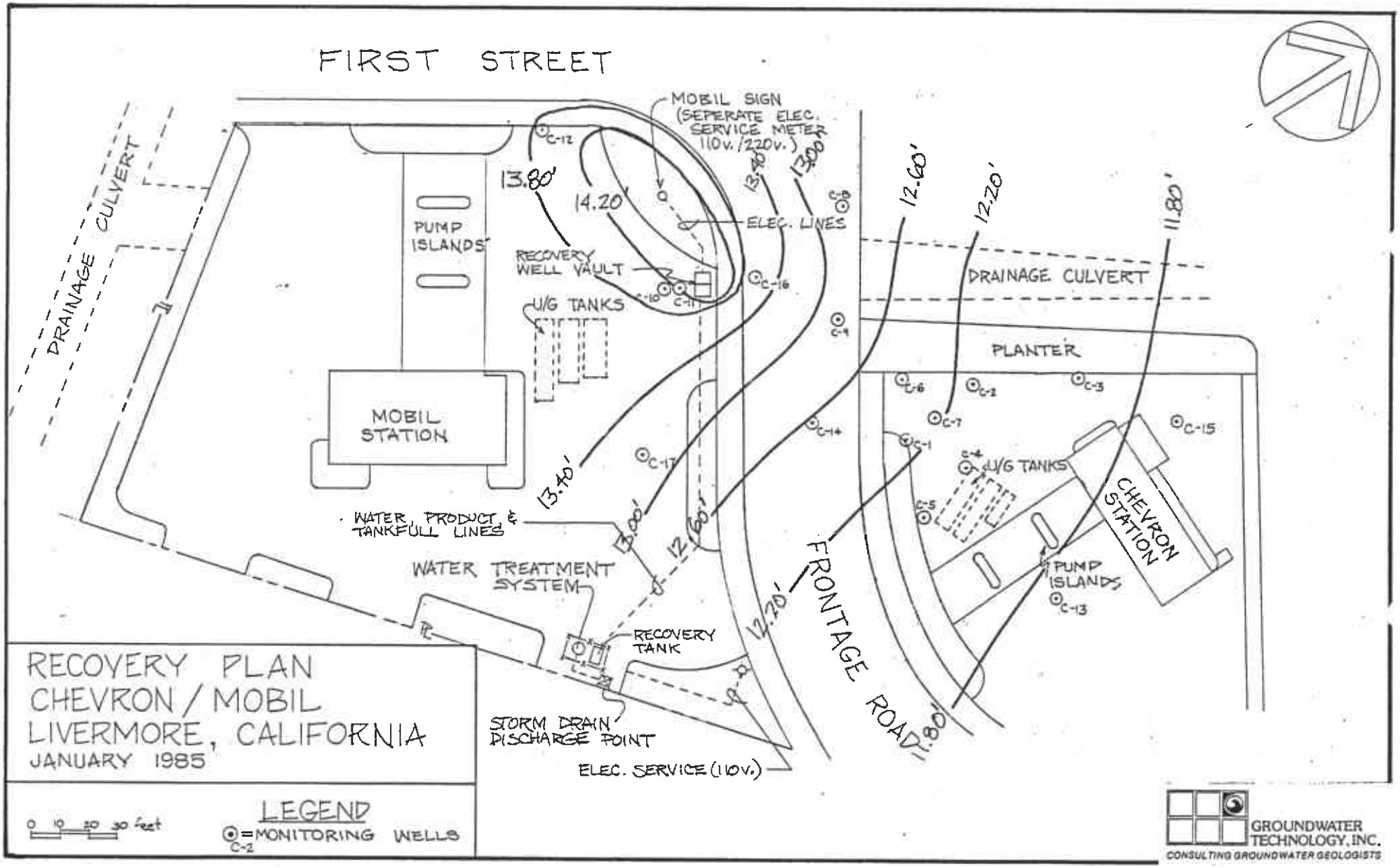
9. The air stripping unit is scheduled to be installed by the end of March.

10. A water sampling program of the air stripper influent and effluent will be conducted to assure the stripper discharge is below the state maximum of 100 ppb dissolved hydrocarbon concentration. The sampling schedule will be weekly for the first month, and on a monthly basis thereafter.

11. A water sampling program for existing monitoring wells containing no free floating product will begin February 15, 1985. This monthly sampling will provide quantitative data to determine the extent of groundwater degradation and to monitor changes in hydrocarbon concentrations thru time.

12. Two additional monitoring wells will be installed to further define possible pathways of product migration (see site map).





RECOVERY PLAN
CHEVRON / MOBIL
LIVERMORE, CALIFORNIA
JANUARY 1985

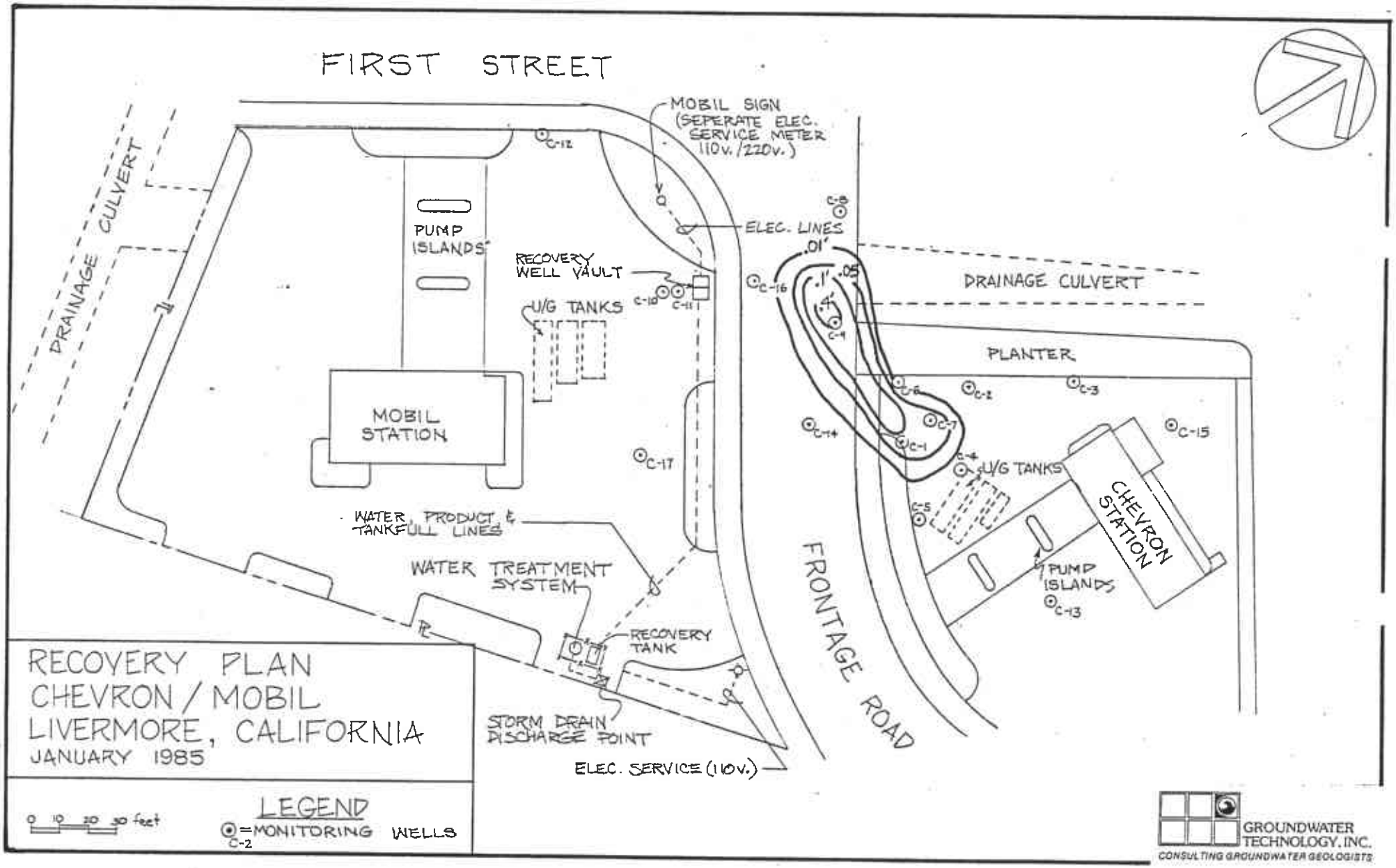
0 10 20 30 feet

LEGEND
C-2 = MONITORING WELLS

GROUNDWATER TECHNOLOGY, INC.
CONSULTING GROUNDWATER GEOLOGISTS

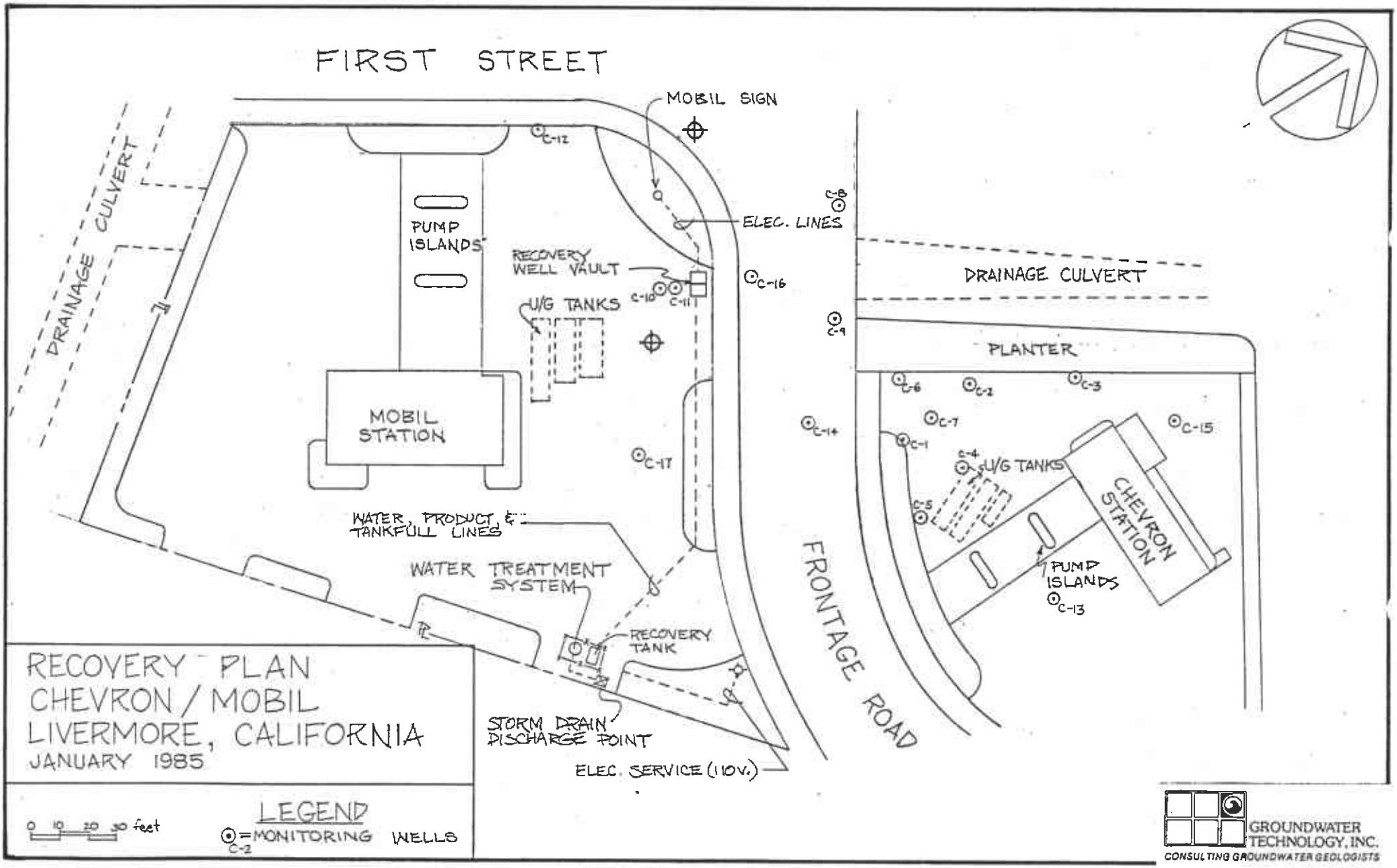
GROUNDWATER GRADIENT

12 FEBRUARY 1985



PRODUCT THICKNESS

12 FEBRUARY 1985



PROPOSED MONITORING WELL LOCATIONS ⊕

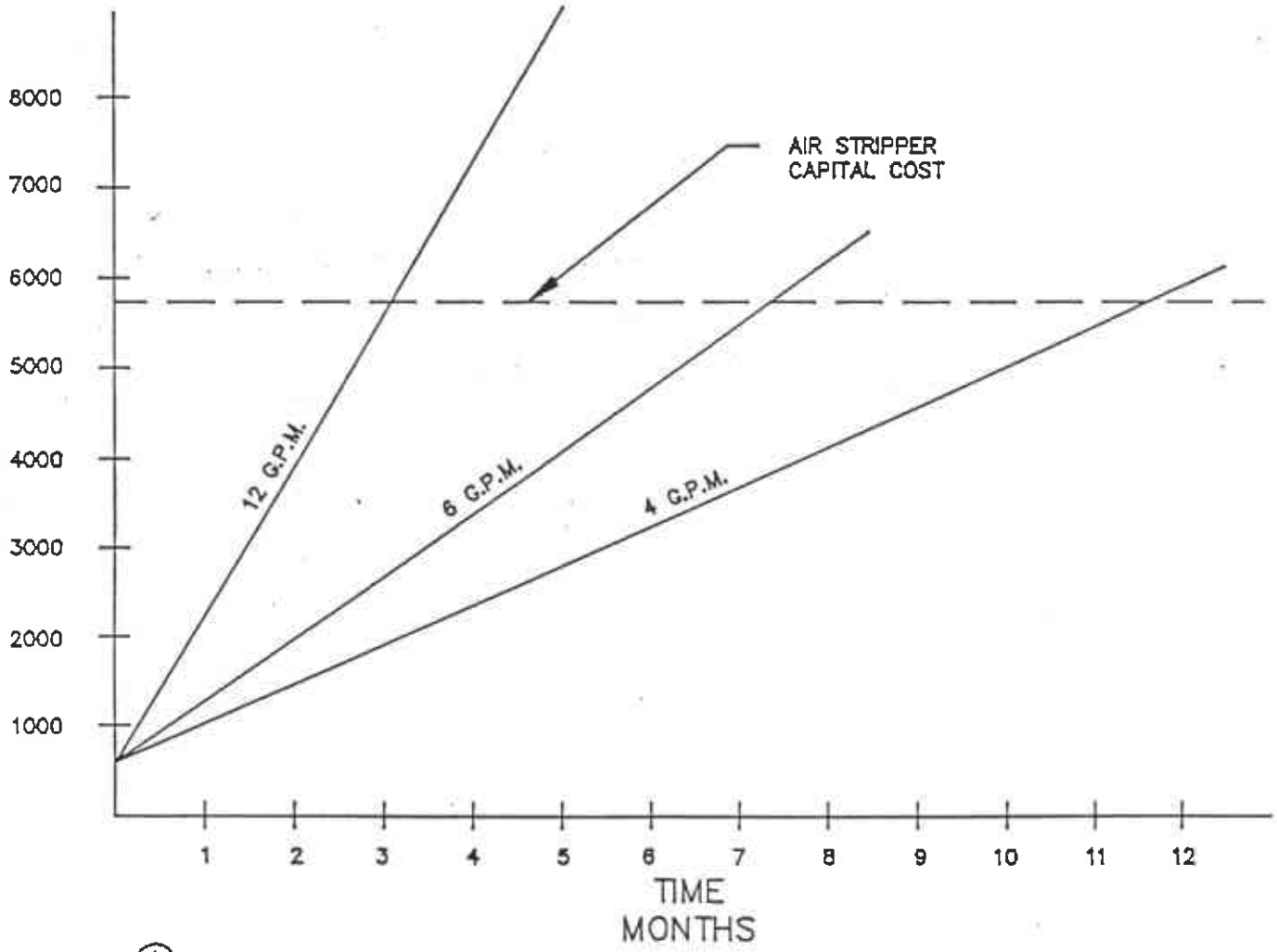
TABLE 1
VOC LOADING vs FLOW

FLOW			VOC CONCENTRATION	LOADING	
G.P.M.	G.P.D.	LBS/DAY	Mg/l	LBS/HOUR	LBS/DAY
2	2880	23904	30	.03	.7
4	5760	47808	30	.06	1.4
6	8640	71712	30	.09	2.1
8	11520	95616	30	.12	2.8
10	14400	119520	30	.15	3.5
12	17280	143424	30	.18	4.2
14	20160	167328	30	.21	4.9
16	23040	191232	30	.24	5.6

TABLE 2
ESTIMATED BED LIFE
600 LB. ADSORBER

G.P.M.	VOC CONCENTRATION Mg/l	CARBON CAPACITY %	BED LIFE DAYS
2	30	10	85
4	30	10	42
6	30	10	28
8	30	10	21
10	30	10	17
12	30	10	14
14	30	10	12
16	30	10	11

FIGURE I
CARBON OPERATING COSTS ①



① BASED UPON CARBON COSTS @ $.90/LB AND DISPOSAL @ $1.50/LB ONLY. RENTAL OF ADSORBER, INSTALLATION, MAINTENANCE NOT INCLUDED.

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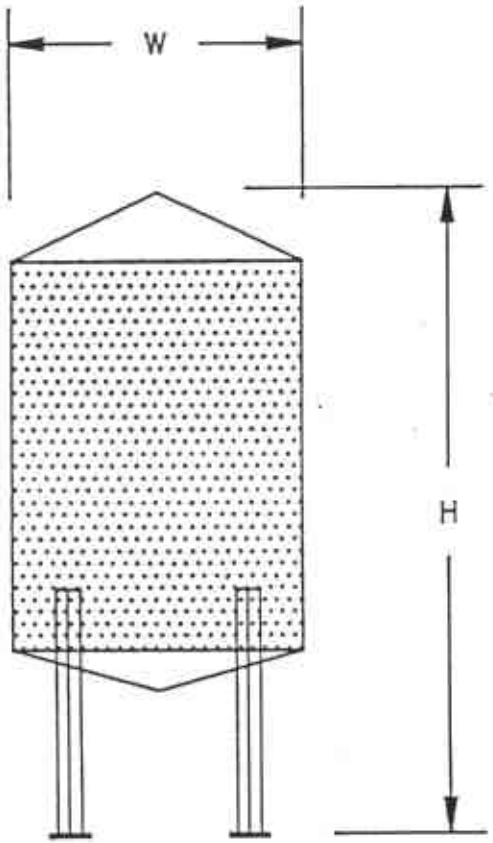

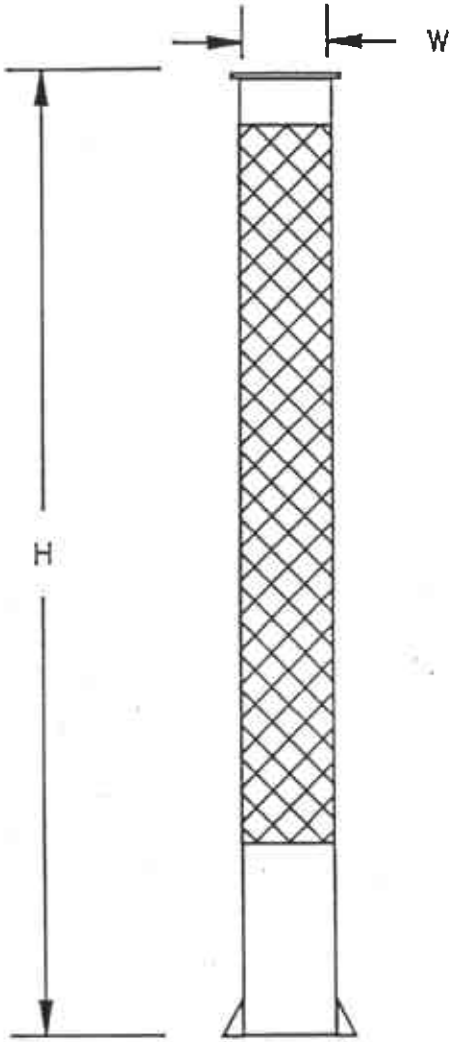

SYMBOL	DIMENSION	CARBON ADSORBER	AIR STRIPPER
H	HEIGHT (FT)	7	17
W	WIDTH (FT)	3	1
C	CAPACITY (FT^3)	27	11
MAXIMUM G.P.M.		15	20