DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Fisher Scientific
Facility Address: 755 State Highway Route 202, Bridgewater Township, NJ 08876
Facility EPA ID #: NJD052207982

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   _X_ If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available, skip to #8 and enter "IN" (more information needed) status code.

   Justification:

SWMUs / AOCs
1. Backfilled Area
2. Drainage Ditches / Detention Ponds
3. Hazardous Waste Storage Tank (closed RCRA Regulated Unit)
4. Hazardous Waste Drum Storage Pad (closed RCRA Regulated Unit)
5. Tank Farm
6. Railroad Siding
7. Interceptor Trench
8. Interceptor Tank
9. Railroad Cut

There is groundwater contamination at every SWMU/AOC, except the backfilled area. This contamination has been addressed and continues to be addressed through a variety of corrective measures performed by Fisher. Contaminated soil existed in the areas of the hazardous waste storage tank, the tank farm and the railroad siding; while the soils in all of the other SWMUs/AOCs were sampled and found to be below NJDEP residential cleanup standards. Contaminated soil in the area of the hazardous waste storage tank was removed as part of an excavation project to upgrade the tank, and later the hazardous waste storage tank itself was removed and closed under state supervision. The hazardous waste drum storage pad was also closed under state supervision. During installation of the concrete floor in the tank farm and prior to lining the railroad siding with concrete, contaminated soils were removed from both of those areas. The backfilled area has been given a no further action determination since there is no soil or groundwater contamination in that area.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

_X_ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

_____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): Solvent contaminated groundwater was first discovered seeping from bedrock at the base of the railroad cut in 1976, just downgradient of the Fisher Scientific property; and it was later discovered in several potable wells off-site in 1983. The contamination was the result of Fisher's poor housekeeping practices. Fisher started monitoring the groundwater in 1982 as part of a site-wide investigation and in 1984 submitted a Hydrogeological Report, which proposed a remedial action involving the recovery and treatment of groundwater. NJDEP issued an ACO in 1985 requiring Fisher to submit remedial investigation and remedial action plans. Fisher submitted the RI/FS later that year, but it was deemed unacceptable by NJDEP. NJDEP required a modified remedial investigation and interim measures before continuing further with the remedial action plan. In 1986 NJDEP issued another ACO authorizing the transfer of ownership of Fisher from Allied Signal to the Henley Group. Fisher performed the modified remedial investigation and interim measures to NJDEP's approval and in 1989 received approval on their Remedial Action Plan. Groundwater remediation began in 1991. The groundwater is contaminated both on and off-site above applicable standards. Originally, the cleanup objective for the remediation of the groundwater was the NJDEP Corrective Action Criteria, but this was replaced with NJDEP's Groundwater Quality Standards in 1993. The primary constituents exceeding standards are carbon tetrachloride, chloroform, methylene chloride and trichloroethene. Total VOC concentrations have been as high as 906 ppm on-site and 3.94 ppm off-site. Both the perched water aquifer and the regional groundwater aquifer are contaminated, with the majority of the VOC contamination existing in the shallow zone of the regional aquifer. DNAPLs are also present in the dissolved groundwater phase of the regional bedrock aquifer. There are two zones of saturation in the area of the site: the perched water table and the regional bedrock aquifer. The perched water table is located in the highly weathered bedrock just under the unconsolidated, unsaturated soils and just above the more competent, unsaturated bedrock layer of the Passaic Formation. The water from the perched water table slowly infiltrates into the regional bedrock aquifer through joints and fractures in the bedrock layer, hydraulically connecting the two zones. There are two significant fractures which transect the Fisher property. Groundwater flow is mainly to the south and southeast and it is primarily lateral.

Footnotes:

[1]"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations *designated* at the time of this determination)?

_X_ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): In 1976, NJDEP required Fisher to prevent further migration of the contaminated groundwater by installing an interceptor trench and sump pits just south of the railroad unloading station and the tank farm to passively intercept contaminated water from the perched groundwater aquifer. The groundwater collects in the trench and then enters the series of pits from which it is pumped to the municipal sewer system. Also at this time, regular pumping of one monitoring well (MW#4) at a rate of 5 gallons per minute was initiated, and this contaminated groundwater was also released to the municipal sewer system. In 1982 Fisher excavated contaminated soils and constructed containment areas around its various storage and unloading stations in order to be in compliance with RCRA requirements and in order to prevent further groundwater contamination as the result of poor housekeeping practices. In 1983 when Fisher sampled several potable wells off-site and found them to be contaminated with the same constituents as on-site, Fisher paid for 469 affected homes in the neighborhood to be either hooked up to the municipal water system or to be supplied with carbon filtration systems. After the approval of the Remedial Action Plan, Fisher initiated the soil/bedrock vacuuming to remove the sources from the perched water aquifer and to see if DNAPL could be removed from the bedrock. However, contaminants trapped in the bedrock could not be remediated with the vapor extraction system. Fisher then initiated the groundwater recovery system to remediate the regional groundwater aquifer. This system consisting of the pumping of five monitoring wells for a total recovery of about 14 gallons per minute began in 1991. The groundwater is pumped from these wells to the facility wastewater treatment system. Groundwater data has been collected regularly since 1985 as required by the ACO. The continued operation and maintenance of the groundwater recovery system are required by the approved Remedial Action Plan.
The groundwater is still contaminated with high levels of VOCs, however, the aerial extent of the groundwater contamination has decreased due to the startup of the groundwater recovery system in 1991. The data supports the conclusion that the plume has shrunk due to the pumping of the regional groundwater aquifer and that it has become stable during the past several years. A few monitoring wells south of the site have consistently had either no detections or very low concentrations which did not exceed standards, showing that the plume has not continued to migrate.

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

____ If yes - continue after identifying potentially affected surface water bodies.

_X_ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

__X__ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): Per the requirements in the 1985 ACO and in the approved 1989 Remedial Action Plan, Fisher will continue to perform quarterly groundwater monitoring for fourteen on-site and off-site monitoring wells (including the five recovery wells) and annual groundwater monitoring for five off-site monitoring wells until NJDEP's Groundwater Quality Standards are met. Since the groundwater is still highly contaminated the groundwater recovery system's effectiveness will be reevaluated in another four years to determine if additional remediation work can be done.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__X__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Fisher Scientific facility , EPA ID # NJD052207982 , located at 755 State Highway Route 202, Bridgewater Township, NJ 08876. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

_____ IN - More information is needed to make a determination.

Completed by: Elizabeth Butler **Date:** 9/30/99

Elizabeth Butler, Project Manager
RCRA Programs Branch
EPA Region 2

Barry Tornick **Date :** 9/30/99

Barry Tornick, Section Chief
RCRA Programs Branch
EPA Region 2

Approved by: R. Basso **Date:** 9/30/99

Raymond Basso, Chief
RCRA Programs Branch
EPA Region 2

Locations where References may be found:

The references may be found at NJDEP in Trenton or at EPA Region 2 in New York.
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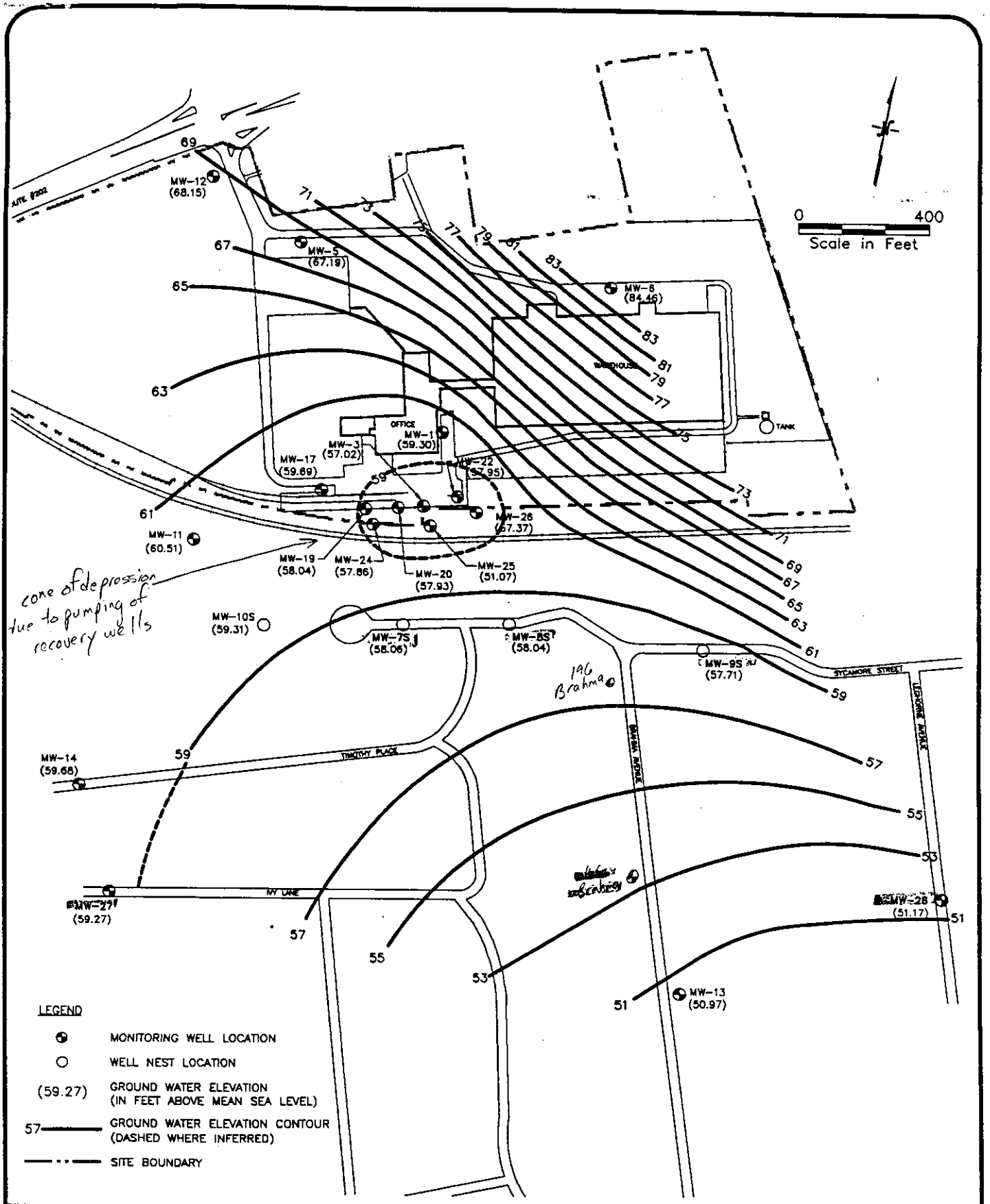


ENVIRON

DRAFTED BY: KPM/TSP | DATE: 4/6/99

GROUND WATER ELEVATION CONTOUR MAP SHALLOW BEDROCK ZONE (Regional Aquifer)

FIRST QUARTER 1999

FISHER BRIDGEWATER PACKAGING FACILITY

FIGURE 1

3912BW5Q

TABLE 4 (continued)
Summary of Analytical Results for Ground Water Samples
Off-Site Monitoring Wells
Fisher Bridgewater Packaging Facility

WELL NAME	MW-95	MW-91	MW-9D	MW-27	MW-28	166 BRAHMA	196 BRAHMA
ENVIRON SAMPLE ID	3912B-MW09S-GW19	3912B-MW09I-GW19	3912B-MW09D-GW19	3912B-MW27-GW19	3912B-MW28-GW19	3912B-166B-GW19	3912B-196B-GW19
MATRIX	GROUND WATER	GROUND WATER	GROUND WATER	GROUND WATER	GROUND WATER	GROUND WATER	GROUND WATER
LABORATORY ID	129935	129937	129936	129507	129508	129931	129932
COLLECTION DATE	5/6/99	5/6/99	5/6/99	5/4/99	5/4/99	5/5/99	5/5/99
COMMENTS							
Volatile Organic Compounds							
Benzene	ND	ND	ND	ND	ND	ND	ND
[illegible]	ND	ND	ND	ND	ND	[illegible]	7.9
[illegible]	ND	ND	0.77	ND	[illegible]	[illegible]	12
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	0.58
Trichloroethene	ND	ND	ND	ND	ND	ND	3.5
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND
TOTAL VOCs	ND	ND	0.8	ND	[illegible]	[illegible]	24

Notes:

All concentrations are in µg/L.
Only those compounds identified in one or more of the ground water samples are listed in this table.
Total concentrations calculated in two significant figures.
ND = Not Detected.

TABLE C-2
Total VOC Concentrations in Ground Water (ppb)
Quarterly Monitoring Program (1994 - 1998)
Fisher Bridgewater Packaging Facility

Sample Date	Qtr.	MW-1	RW-5[1]	MW-3	RW-2[2]	MW-7S	MW-7I	MW-7D	MW-8S	MW-8I	MW-8D	MW-9S
Jan-94	1	1,390	343	26,000	6,450	587	9	NS	ND	28	ND	ND
Apr-94	2	1,310	239	45,100	7,180	224	14	6	ND	ND	ND	ND
Jul-94	3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nov-94	4	1,820	483	177,620	5,815	210	12	NS	ND	3	NS	ND
1994 Average		**1,507**	**355**	**82,907**	**6,482**	**340**	**12**	**6**	**ND**	**10**	**ND**	**ND**
Feb-95	1	1,227	375	46,059	8,190	66	6	NS	ND	ND	NS	ND
May-95	2	1,960	316.9	188,700	9,450	87	9	0.22	1	1	11	ND
Aug-95	3	3,410	584	128,700*	11,100	68	9	NS	ND	12	NS	ND
Nov-95	4	1,062	179	29,323*	15,237	81	4	NS	3	4	NS	2
1995 Average		**1,915**	**364**	**98,196**	**10,994**	**76**	**7**	**0.22**	**1**	**4**	**11**	**0.5**
Feb-96	1	673	190	19,352*	4,479	61	2	NS	ND	138	NS	1
May-96	2	1,269*	430	63,874	21,900	89	21	ND	5.4	ND	ND	ND
Aug-96	3	2,232	460	120,860	13,470	79*	3.9	NS	0.2	1.3	NS	ND
Oct-96	4	3,744	424.2	216,250	12,026	81.7*	7.27	NS	1.09	5.17	NS	ND
1996 Average		**1,980**	**376**	**105,084**	**12,969**	**78**	**9**	**ND**	**2**	**36**	**ND**	**ND**
Feb-97	1	1,529	44,525*	124,517	8,639	80	4	NS	3*	54.8	NS	4.1
May-97	2	3,304	6,844.4	50,929.6	8,059	54.4	4.09	0.73	0.80	17.29	12.25	ND
Sep-97	3	513	266*	12,700*	8,430	44.6	7.2	NS	0.16	73.6	NS	ND
Nov-97	4	1,029	2,286	23,678	10,032	52.5	9.14	NS	3.33	4.97*	NS	2.73
1997 Average		**1594**	**13,480**	**52,956**	**8,790**	**58**	**6**	**0.73**	**2**	**38**	**12.25**	**2**
Feb-98	1	747	149	24,176	7,330	36.0	8.74	NS	0.47	17.7	NS	ND
May-98	2	787	560*	26,600	8,760	47.1	4.8	0.84*	0.44	15.6	10.6	ND
Aug-98	3	947	370	7,446	10,127	53.4	6.02	NS	0.43	24.8*	NS	ND
Dec-98	4	742	150	32,400*	6,500*	42.6	21.4	NS	0.50	8.4	NS	ND
1998 Average		**806**	**307**	**22,600**	**8,180**	**44.8**	**10.2**	**0.84**	**0.46**	**16.6**	**10.6**	**ND**
Mar-99	1	1,100	120	16,000*	8,800*	41	6.6	NS	17	14	NS	1.5

had reached max of 3,157 ppb in '91 before recovery system was started

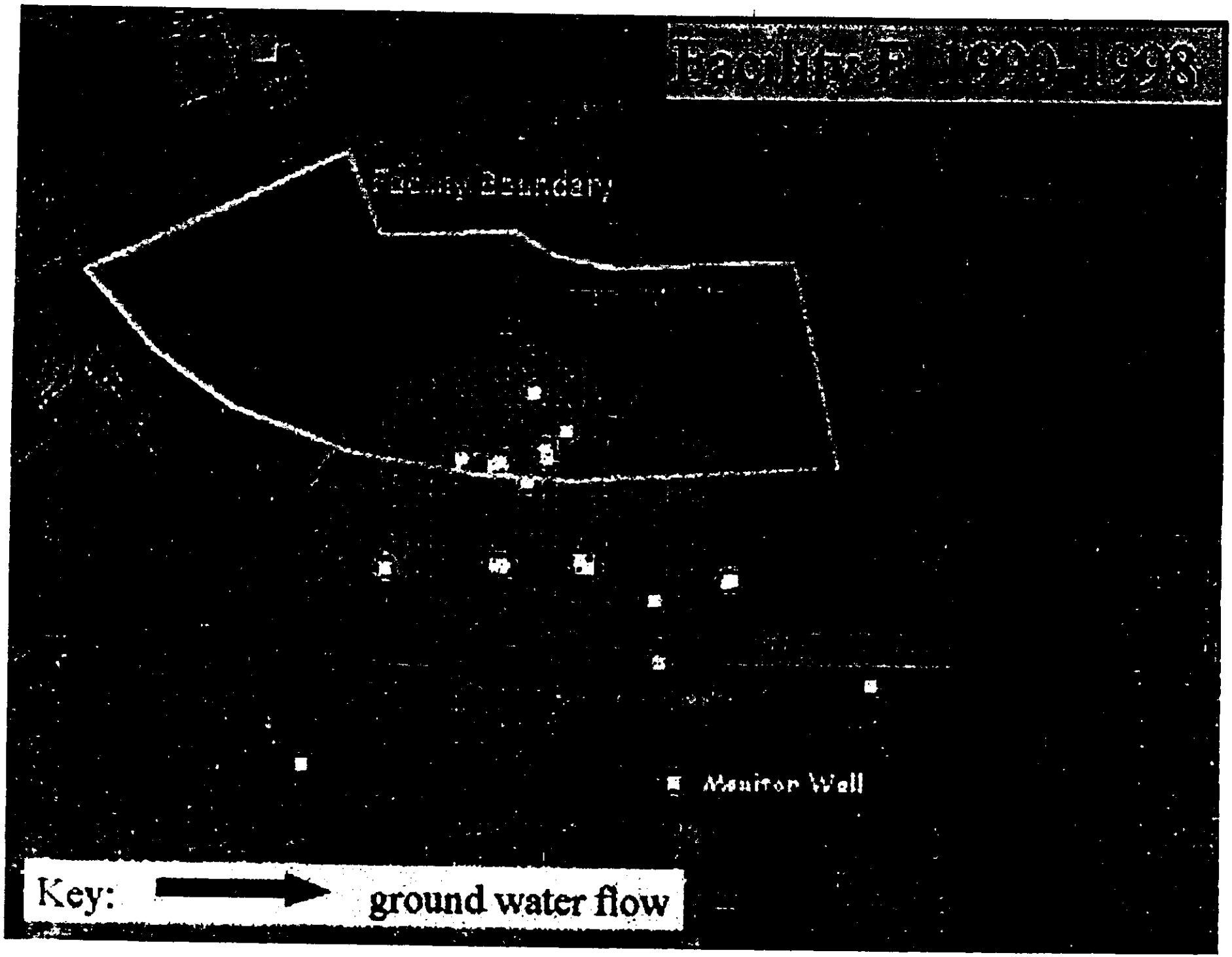
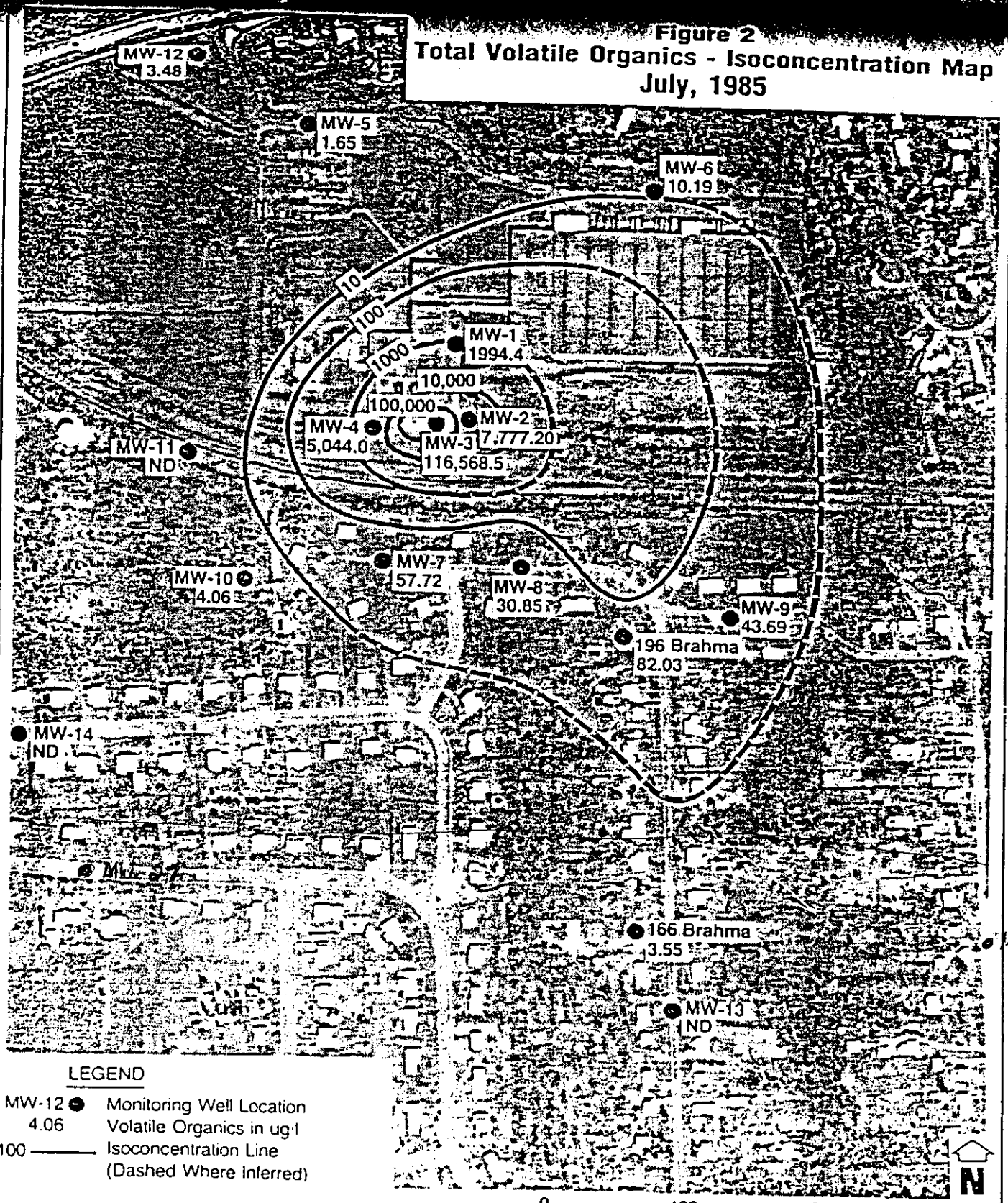
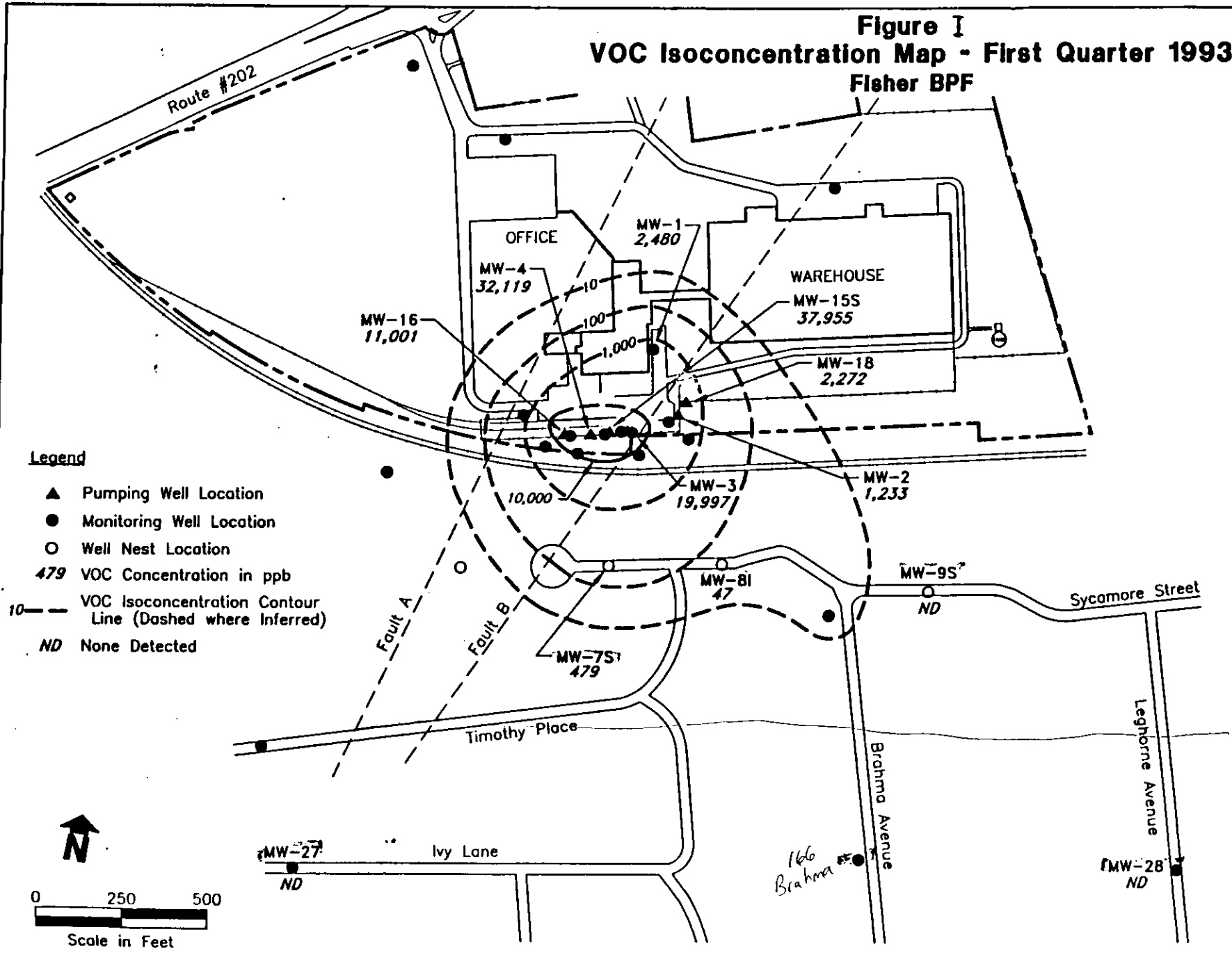

Facility Boundary
Monitor Well
Key:
ground water flow

Figure 2
Total Volatile Organics - Isoconcentration Map
July, 1985



THE ERM GROUP

Figure I
VOC Isoconcentration Map - First Quarter 1993
Fisher BPF



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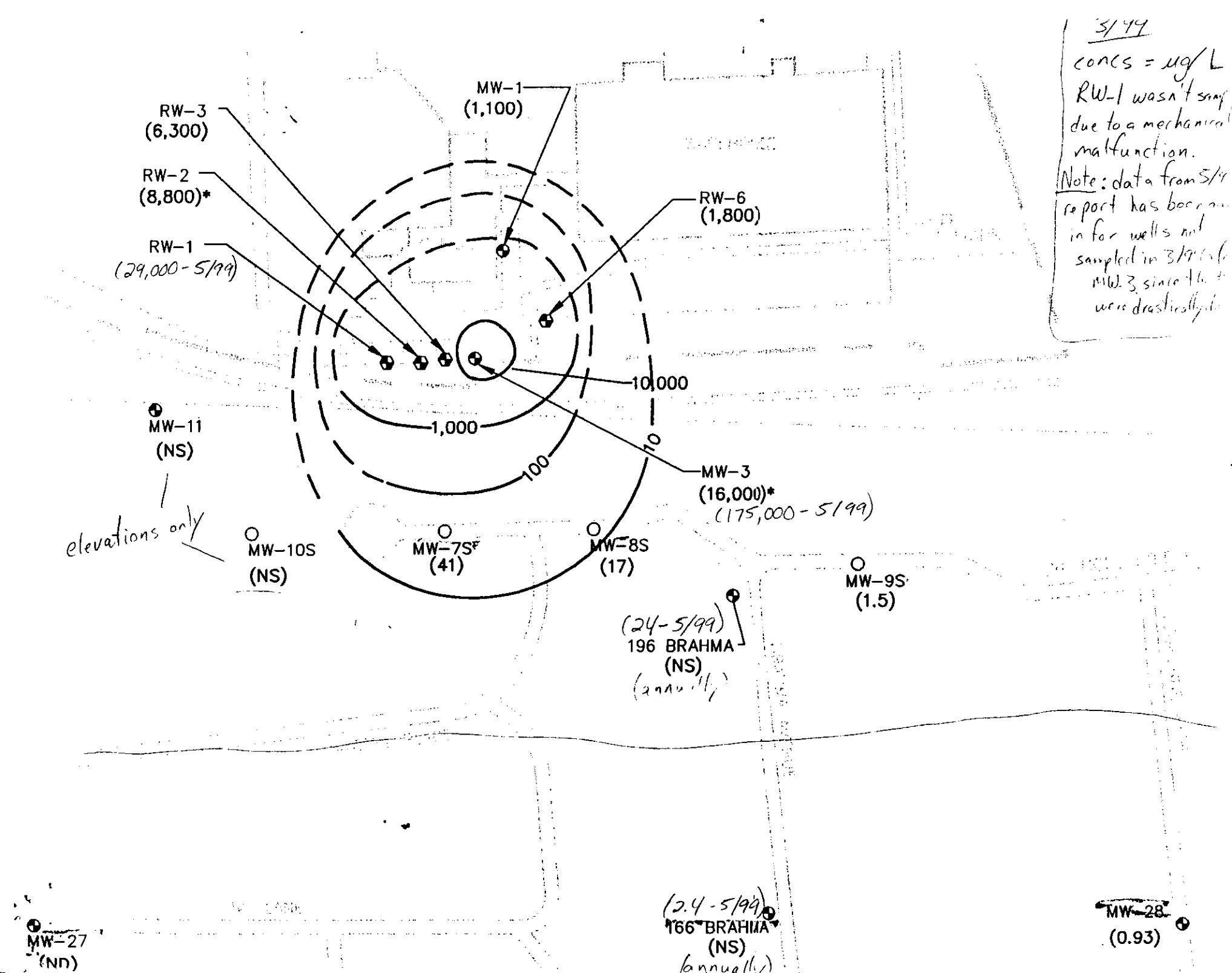

5/99

concs = ug/L

RW-1 wasn't samp
due to a mechanical
malfunction.

Note: data from 5/9
report has been
in for wells not
sampled in 3/9
MW-3 since the
were drastically