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Draft Report
Project No. 60251

Volume 3 of 5
Remedial Investigation Report
ACS NPL Site
Griffith, Indiana

Prepared for:
Steering Committee
ACS PRP Group

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Chicago, Illinois

June 1991

APPENDIX 2
Field Data Forms

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims, K Fulmer Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: B
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Typha latifolia	obl		11.		
2. Vitis vulpina	FACW-		12.		
3. [illegible]	FACW-		13.		
4. [illegible]	FAC		14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale:

yes

SOILS

Series/phase: Maumee loamy fine sand Subgroup:[2] Typic Hoplaquolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No ✓
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No _____
Matrix Color: N 2/0 Black Mottle Colors:
Other hydric soil indicators: wet
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: meets chroma criteria

yes

HYDROLOGY

Is the ground surface inundated? Yes ✓ No _____ Surface water depth: ~ 10 inches
Is the soil saturated? Yes _____ No _____
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No _____
Rationale:

yes

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date: _____
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: E
Note: If a more detailed site description is necessary, use the back of data form or a field notebook

Do normal environmental conditions exist at the plant community?
Yes ✓ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ✓ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Populus deltoides	FAC+		11.		
2. Rubus villosus (low blkberry)	None		12.		
3. Onoclea sensibilis	FACW		13.		
4. Cornus ammomum	FACW+		14.		
5. Salix exigua	OBL		15.		
6. Fragaria virginiana	FAC-		16.		
7. Nyssa sylvatica	FACW- (wet.)		17.		
8. Lycopodium lucidulum	FACW+		18.		
9. Sedge spp	?		19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 85.7%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale: _____

SOILS

Series/phase: Maumee loamy fine sand Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No _____
Matrix Color: N 2/0 Black Mottle Colors: _____
Other hydric soil indicators: wet
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: meets chroma criterion

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth: _____
Is the soil saturated? Yes ✓ No _____
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No _____
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision: _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy"

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: 6
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Cornus amomum	FACW+		11.		
2. Onoclea sensibilis	FACW		12.		
3. Salix discolor	FACW		13.		
4. Liquidambar styraciflua	FACW		14.		
5. Nyssa sylvatica	FACW+		15.		
6. Vitis vulpina	FACW-		16.		
7. Rubus allegheniensis	FACU+		17.		
8. Ludwigia glandulosa	OBL		18.		
9. Spiraea alba	FACW+		19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 88%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale: _____

SOILS

Series/phase: Drummer loamy fine sand Subgroup:[2] typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No _____
Matrix Color: 10YR 2/1 Black Mottle Colors: _____
Other hydric soil indicators: moist/wet
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: meets the chroma requirement

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth: _____
Is the soil saturated? Yes ✓ No _____
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No _____
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: J
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Cornus amomum	FACW+		11.		
2. Salix eriqua	OBL		12.		
3. Ulmus rubra	FAC		13.		
4. sedge spp.	?		14.		
5. Onoclea sensibilis	FACW		15.		
6. Fraxinus virginiana	FAC-		16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale:

SOILS

Series/phase: Muskego loamy fine sand Subgroup:[2] Typic Haplaquepts
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: 10YR 2/1 Black Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ✓ No ____
Rationale: meets chroma criteria

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ____ Surface water depth: ~ 5 inches
Is the soil saturated? Yes ✓ No ____
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date: _____
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: M
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Quercus alba	FACU		11.		
2. Quercus Coccinea	Nulv		12.		
3.			13.		
4. [illegible]	FAC		14.		
5. Cornus sericea	FAC-		15.		
6. Vitis aestivalis	FACU		16.		
7. Spiraea alba	FACW+		17.		
8.			18.		
9.			19.		
10.			20.		

white oak
~~Red~~ oak
~~[illegible]~~
[illegible]
[illegible]
Summer Grape
[illegible]

Percent of dominant species that are OBL, FACW, and/or FAC 60%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale: _____

yes

SOILS

Series/phase: Plainfield fine sand Subgroup:[2] Typic Udipsamments
Is the soil on the hydric soils list? Yes _____ No ✓ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No _____ Gleyed? Yes _____ No _____
Matrix Color: 10YR 3/3 Dark brown Mottle Colors: _____
Other hydric soil indicators: _____
Is the hydric soil criterion met? Yes _____ No ✓
Rationale: _____

no

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth: _____
Is the soil saturated? Yes _____ No ✓
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes _____ No ✓
Rationale: _____

no

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: N
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Quercus alba	FACU		11.		
2. Quercus coccinea	UPL		12.		
3. Ludwigia glandulosa	OBL		13.		
4. Populus tremuloides	FAC		14.		
5. Galium aparine	FACU		15.		
6. Teucris escuienta	FACU		16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 40%
Is the hydrophytic vegetation criterion met? Yes ____ No ✓
Rationale:

SOILS

Series/phase: Plainfield fine sand Subgroup:[2] Typic Udipsamments
Is the soil on the hydric soils list? Yes ____ No ✓ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ____ Gleyed? Yes ____ No ____
Matrix Color: 7.5YR 4/6 strong brown Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ____ No ✓
Rationale:

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth:
Is the soil saturated? Yes ____ No ✓
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ____ No ✓
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: R1
Note: If a more detailed site description is necessary, use the back of data form or a field notebook

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Populus deltoides	FACW+		11. Gleditsia triacanthos	FAC-	Canopy & Sand
2. Prunus pensylvanica	FACU-		12.		
3. Salix exigua	—		13.		
4. Cornus stolonifera	FACW		14.		
5. Ampelopsis arborea	none		15.		
6. Rosa carolina	FACU-		16.		
7. Apocynum pulescens	none		17.		
8. Adiantum pedatum	FACU+		18.		
9. Galium aparine	FACU		19.		
10. Sambucus canadensis	FACW-		20.		

Percent of dominant species that are OBL, FACW, and/or FAC 62.5%
Is the hydrophytic vegetation criterion met? Yes ____ No ✓
Rationale:

SOILS

Series/phase: Plainfield fine sand Subgroup:[2] Typic Udipsamments
Is the soil on the hydric soils list? Yes ____ No ✓ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ____ Gleyed? Yes ____ No ____
Matrix Color: 10 YR 4/4 dark yellowish br. Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ____ No ✓
Rationale:

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth:
Is the soil saturated? Yes ____ No ✓
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ____ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy"

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date: _____
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: R
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Populus deltoides	FACW		11.		
2. P. grandidentata	FACU		12.		
3. Salix nigra	OBL		13.		
4. Cornus stolonifera	FACW		14.		
5. Sambucus canadensis	FACW		15.		
6. Onoclea sensibilis	FACW		16.		
7. Ludwigia glandulosa	OBL		17.		
8. Galium aparine	FACU		18.		
9. Cyperus esculentus	none		19.		
10. Rhexia hispidissima	FACW		20.		

Percent of dominant species that are OBL, FACW, and/or FAC 77%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale: _____

SOILS

Series/phase: Maumee loamy fine sand Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No ✓
Matrix Color: 10YR 3/1 very dark gray Mottle Colors: _____
Other hydric soil indicators: _____
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: meets Onsite criteria

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth: _____
Is the soil saturated? Yes ✓ No _____
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes _____ No _____
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: 8
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ✓ No ____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Populus tremuloides	FAC		11. Fraxinus pennsylvanica	none	
2. Quercus palustris	FACW		12. Viburnum trilobum	none	(RR)
3. Q. coccinea	none		13. Toxicodendron virginiana	FAC-	
4. Q. velutina	none		14.		
5. Rhus copallina	none		15.		
6. Cornus stolonifera	FACW		16.		
7. Amelanchier arbutifolia	none		17.		
8. Salix nigra	obl		18.		
9. Cinnamomum serotinum	FACW		19.		
10. Prunus serotina	none		20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ____ No ____
Rationale:

SOILS

Series/phase: Plainfield fine Sand Subgroup:[2] Typic Udipsamments
Is the soil on the hydric soils list? Yes ____ No ✓ Undetermined
Is the soil a Histosol? Yes ____ No ____ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ____ Gleyed? Yes ____ No ____
Matrix Color: 10YR 5/8 Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ____ No ✓
Rationale:

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth:
Is the soil saturated? Yes ____ No ✓
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ____ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision:

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: 4
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Riccocarpus natans	none		11.		
2. Ricciocarpus fluitans	none		12.		
3. Galium aparine	FACU		(on railroad embankment)		
4. Typha latifolia	obl		14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale:

SOILS

Series/phase: Maumee loamy fine sand Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: N 2/0 black Mottle Colors:
Other hydric soil indicators: unable to get actual samples, in standing water
Is the hydric soil criterion met? Yes ✓ No ____
Rationale: meets chroma requirement

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ____ Surface water depth: 6 in - 12 inches
Is the soil saturated? Yes ✓ No ____
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision.

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: V
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Typha angustifolia	obl		11.		
2.			12.		
3.			13.		
4.			14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

row leaf cattail

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale:

yes

SOILS

Series/phase: Muumee loamy fine sand Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No ✓
Matrix Color: A1 2/0 black Mottle Colors:
Other hydric soil indicators: under water
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: meet chroma criteria

yes

HYDROLOGY

Is the ground surface inundated? Yes ✓ No _____ Surface water depth: 6-15 inches
Is the soil saturated? Yes _____ No _____
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No _____
Rationale:

yes

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): L. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: W
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Galium aparine	FACW		11.		
2. Thelypteris thelypteroides	FACW		12.		
3. Onoclea sensibilis	FACW		13.		
4. Typha angustifolia	obl		14.		
5. U Salix discolor	obl		15.		
6. Cornus amomum	FACW+		16.		
7. Apocynum androsaemifolium	none		17.		
8. Salix nigra			18.		
9. Spiraea tomentosa	none		19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 83.3 %
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale:

SOILS

Series/phase: Muscatine loam Soils Subgroup:[2] Typic Endoaquolls
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: N 2/0 Black Mottle Colors:
Other hydric soil indicators: Sampling point inundated
Is the hydric soil criterion met? Yes ✓ No ____
Rationale: meets chroma requirements

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ____ Surface water depth: 6-8 inches
Is the soil saturated? Yes ____ No ____
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy"

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: Y
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Salix exigua	OBL		11. Rosa multiflora	FACU	
2. Quercus palustris	FACW		12. Hamamelis virginiana	FACU	
3. Fraxinus pennsylvanica	FACW		13.		
4. Quercus velutina	FACU		14.		
5. Betula alleghaniensis	FAC		15.		
6.			16.		
7. Acer saccharinum	OBL		17.		
8. Salix nigra	OBL		18.		
9. Symphoricarpos orbiculatus	FACU		19.		
10. Carex stipata	FACW		20.		

Percent of dominant species that are OBL, FACW, and/or FAC 70
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale: _____

SOILS

Series/phase: [illegible] Subgroup:[2] Typic hydraquolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No ✓
Matrix Color: N 2/0 Black Mottle Colors: _____
Other hydric soil indicators: _____
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: [illegible]

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth: _____
Is the soil saturated? Yes ✓ No _____
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes _____ No _____
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date: _____
Project/Site: HGS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: C
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Acer rubrum	OBL		11.		
2. Fraxinus pennsylvanica	FACW		12.		
3. Ulmus americana	FACW		13.		
4. Toxicodendron virginicum	FAC		14.		
5. Quercus coccinea	none		15.		
6. Quercus alba	FACU		16.		
7. Quercus rubra	FACU		17.		
8. Betula alleghaniensis	FACU		18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 40%
Is the hydrophytic vegetation criterion met? Yes _____ No _____
Rationale: _____

SOILS

Series/phase: Maumee [illegible] Subgroup:[2] Typic hapludolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No ✓
Matrix Color: N 2/0 Black Mottle Colors: _____
Other hydric soil indicators: _____
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: _____

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth: _____
Is the soil saturated? Yes ✓ No _____
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No _____
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision: _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date: _____
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: D2
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Quercus borealis	none		11.		
2. Quercus velutina	none		12.		
3. Populus deltoides	FACW		13.		
4. Hamamelis virginiana	FACU		14.		
5. Stachyurus grandiflorus	FAC		15.		
6. Solidago altissima	FACU		16.		
7. Verbascum thapsus	none		17.		
8. Vitis aestivalis	FACU		18.		
9. Caltha palustris	OBL		19.		
10. Dipsacus sylvestris	none		20.		

Percent of dominant species that are OBL, FACW, and/or FAC 50%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale: _____

SOILS

Series/phase: Plainfield loamy sand Subgroup:[2] Typic Udipsamments
Is the soil on the hydric soils list? Yes _____ No ✓ Undetermined _____
Is the soil a Histosol? Yes _____ No _____ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No _____ Gleyed? Yes _____ No _____
Matrix Color: 10YR 2/1 Mottle Colors: _____
Other hydric soil indicators: _____
Is the hydric soil criterion met? Yes _____ No X
Rationale: Transected wetland/upland boundary sample point at an abandoned railroad bed

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth: _____
Is the soil saturated? Yes _____ No ✓
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes _____ No ✓
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: E2
Note: If a more detailed site description is necessary, use the back of data form or a field notebook

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Ludwigia glandulosa	obl		11.		
2. Galium aparinum	FACW		12.		
3. Rosa multiflora	FACU		13.		
4. Salix eriocephala	FACW		14.		
5. Sonchus arvensis	FAC-		15.		
6. Xanthoxylum simplicinum	[illegible]		16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 60%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale:

SOILS

Series/phase: Niawaw loamy fine sand Subgroup:[2] Typic Haplaquepts
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: ____ Mottle Colors: ____
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ____ No ✓
Rationale: unable to obtain soil sample - sampling point on railroad embankment bordering ditch and P/EM/SS area

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth:
Is the soil saturated? Yes ____ No ✓
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ____ No ✓
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: H2
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Viburnum prunifolium	FACU		11.		
2. Rubus canadensis			12.		
3. Ludwigia glandulosa	OBL		13.		
4. Steironema ciliatum	FAC		14.		
5. Corylus americana	FACU		15.		
6. Sonchus arvensis	FAC-		16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

lack hows
blackberry
dwic
rather bells
wolfbend
sow thistle

Percent of dominant species that are OBL, FACW, and/or FAC 40%
Is the hydrophytic vegetation criterion met? Yes ____ No ✓
Rationale:

no

SOILS

Series/phase: Plainfield sand Subgroup:[2] Typic Udipsamments
Is the soil on the hydric soils list? Yes ____ No ✓ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: ____ Mottle Colors: ____
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ____ No ✓
Rationale: Unable to obtain soil sample - wetland boundary is at a ditch beside the railroad embankment, too many rocks

no

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth: 4-5 feet
Is the soil saturated? Yes ____ No ✓
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ____ No ✓
Rationale:

no

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ✓
Rationale for jurisdictional decision: [illegible] 2-3 feet SE [illegible]

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s) R. Nims Date
Project/Site: ACS State IN County: LAKE
Applicant/Owner EPA Plant Community #/name Q2
Note: If a more detailed site description is necessary, use the back of data form or a field notebook

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Calamagrostis canadensis	FACW		11.		
2. Onoclea sensibilis	obl		12.		
3. Solidago altissima	FACU		13.		
4. Dipsacus sylvestris	FACU		14.		
5. Populus tremuloides	FAC		15.		
6. Ulmus rubra	FAC		16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 60%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale: ____

SOILS

Series/phase: Houghton Muck Subgroup:[2] Typic Haplosaprists
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: N 2/0 Black Mottle Colors: ____
Other hydric soil indicators: ____
Is the hydric soil criterion met? Yes ✓ No ____
Rationale: meets criteria requirements

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth: ____
Is the soil saturated? Yes ✓ No ____
Depth to free-standing water in pit/soil probe hole: ____
List other field evidence of surface inundation or soil saturation
____
Is the wetland hydrology criterion met? Yes ✓ No
Rationale ____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision ____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure
[2] Classification according to "Soil Taxonomy"

B-2

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R Nims Date:
Project/Site: ACS State: IN County LAKE
Applicant/Owner: EPA Plant Community #/Name: N 2
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Populus tremuloides	FAC		11.		
2. Cornus amomum	obl		12.		
3. Salix nigra	obl		13.		
4. Salix exigua	obl		14.		
5. Sparganium eurycarpum	FAC		15.		
6. Vitis vulpina			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Quaking Aspen
swamp dogwood
sandbar willow
and/or willow
Frost bells
for grape

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale: _____

SOILS

Series/phase: Maumee loamy fine sand Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined _____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ✓
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: N 2/0 Mottle Colors: _____
Other hydric soil indicators: _____
Is the hydric soil criterion met? Yes ✓ No ____
Rationale: Unable to obtain sample - area inundated

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ____ Surface water depth: 6-9 inches
Is the soil saturated? Yes ____ No ____
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ____ No ____
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

APPENDIX J

Tracer Research Investigation

Tracer Research Corporation

PREPARED FOR:

Warzyn Engineering Inc.
2100 Corporate Drive
Addison, Illinois 60101
(708)691-5000

SHALLOW GROUNDWATER INVESTIGATION
AMERICAN CHEMICAL SERVICE INC.
GRIFFTIH, INDIANA

APRIL 1990

SUBMITTED BY:

Karen L Guess

Tracer Research Corporation

WZEGACS.MGW
1-90-155-S

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INTRODUCTION

A shallow groundwater investigation was performed by Tracer Research Corporation (TRC) at American Chemical Service Inc. located in Griffith, Indiana. The investigation was conducted on March 26-29 and April 2, 1990 under contract to Warzyn Engineering Inc. The purpose of the investigation was to determine the extent of contamination by volatile organic compounds in the groundwater.

During the survey, a total of fifty-five groundwater samples were collected and analyzed from thirty-eight sampling locations. Samples were analyzed for volatile organic compounds from the following suite:

benzene
toluene
ethylbenzene
xylenes
total hydrocarbons (THC)

Xylenes are reported as the total of the three xylene isomers and total hydrocarbons are reported as gasoline range compounds consisting of approximately C_4-C_9 aliphatic, alicyclic and aromatic compounds.

The compounds in this suite were chosen as target compounds because of their suspected presence in the groundwater. Groundwater samples were screened on a gas chromatograph equipped with a flame ionization detector (FID).

EQUIPMENT

Tracer Research Corporation utilized a one ton Ford analytical field van that was equipped with one gas chromatograph and two Spectra Physics computing integrators. In addition, the van has two built-in gasoline powered generators that provide the electrical power (110 volts AC) to operate all of the gas chromatographic instruments and field equipment. A specialized hydraulic mechanism consisting of two cylinders and a set of jaws was used to drive and withdraw the sampling probes. A hydraulic hammer was used to assist in driving probes past cobbles and through unusually hard soil.

GROUNDWATER SAMPLING PROCEDURES

Sampling probes consist of 7 to 14-foot lengths of 3/4 inch diameter hollow steel pipe. Groundwater samples were collected by driving the hollow probes with detachable drive points below the water table. Once at the desired depth the probe was withdrawn several inches to permit water inflow into the resulting hole. Groundwater samples were collected between the depths of 5 and 15 feet below grade. Once inserted into the ground, the above-ground end of the sampling probes were fitted with a vacuum adaptor (metal reducer) and a length of polyethylene tubing leading to a vacuum pump. A vacuum of up to 24 inches of mercury was applied to the interior of the probe and open hole for 15 to 20 minutes or until the water was drawn up the probe. The water thus accumulated was then removed by drawing a vacuum on a 1/4 inch polyethylene tube inserted down the probe to the bottom of the open hole. Loss of volatile compounds by evaporation is accordingly reduced when water is induced to flow into the very narrow hole, because it can be sampled with little exposure to air. The polyethylene tubing was only used once and then discarded to avoid any cross-contamination problems.

Groundwater samples were collected in 40 mL VOC vials that are filled to exclude any air and then capped with Teflon-lined septa caps. Water samples were analyzed by injecting headspace in the sample container created by decanting off approximately half of the liquid in the bottle. Headspace analysis is the preferred technique when a large number of water samples are to be performed daily. The method is more time efficient for the measurement of volatile organics than direct injection because there is less chance for semi-volatile and non-volatile organics to contaminate the system as there is with direct injection. Depending upon the partitioning coefficient of a given compound, the headspace analysis technique can also yield greater sensitivity than the direct injection technique. Both methods are similar in terms of precision and accuracy.

ANALYTICAL PROCEDURES

A Varian 3300 gas chromatograph, equipped with a flame ionization detector (FID), was used for the analyses. Compounds were separated on a 3' by 1/8" OD packed column with OV-101 as the stationary phase in a temperature controlled oven at 60°C. Nitrogen was used as the carrier gas.

Hydrocarbon compounds detected in the groundwater were identified by chromatographic retention time. Quantification of compounds was achieved by comparison of the detector response of the sample with the response measured for calibration standards (external standardization). Instrument calibration checks were run periodically throughout the day and system blanks were run at the beginning of the day to check for contamination in the soil gas sampling equipment. Air samples were also routinely analyzed to check for background levels in the atmosphere.

The GC was calibrated for headspace analysis by decanting 10 to 20 mL off of the known aqueous standard so as to leave approximately the same amount of headspace that was in the water headspace samples. The bottle was then resealed and shaken vigorously for 30 seconds. An analysis of the headspace in the vial determined the Response Factor (RF) which was then used to accurately estimate water concentrations.

Detection limits for the compounds of interest are a function of the injection volume as well as the detector sensitivity for individual compounds. Thus, the detection limit varies with the sample size. Generally, the larger the injection size the greater the sensitivity. However, peaks for compounds of interest must be kept within the linear range of the analytical equipment. If any compound has a high concentration, it is necessary to use small injections, and in some cases to dilute the sample to keep it within linear range. This may cause decreased detection limits for other compounds in the analyses.

The detection limits for the selected compounds were approximately 0.1 ug/L, depending on the conditions of the measurement, in particular, the sample size. If any component being analyzed is not detected, the detection limit for that compound in that analysis is given as a "less than" value (e.g. <0.1 ug/L). Detection limits obtained from GC analyses are calculated from the current response factor, the sample size, and the estimated minimum peak size (area) that would have been visible under the conditions of the measurement.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Tracer Research Corporation's normal quality assurance procedures were followed in order to prevent any cross-contamination of groundwater samples.

- Steel probes are used only once during the day and then washed with high pressure soap and hot water spray or steam-cleaned to eliminate the possibility of cross-contamination. Enough probes are carried on each van to avoid the need to reuse any during the day.
- Probe adaptors (TRC's patented design) are used to connect the sample probe to the vacuum pump. The adaptor is designed to eliminate the possibility of exposing the sample stream to any part of the adaptor. Associated tubing connecting the adaptor to the vacuum pump is replaced periodically as needed during the job to insure cleanliness and good fit. At

the end of each day the adaptor is cleaned with soap and water and baked in the GC oven.

- Glass syringes are usually used for only one sample per day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.
- Injector port septa through which samples are injected into the chromatograph are replaced on a daily basis to prevent possible gas leaks from the chromatographic column.
- Analytical instruments are calibrated each day by analytical standards from Chem Service, Inc. Calibration checks are also run after approximately every five sampling locations.
- Subsampling syringes are checked for contamination prior to sampling each day by injecting nitrogen carrier gas into the gas chromatograph.
- Prior to sampling each day, system blanks are run to check the sampling apparatus (probe, adaptor, 10 cc syringe) for contamination by drawing ambient air from above ground through the system and comparing the analysis to a concurrently sampled ambient air analysis.
- All sampling and subsampling syringes are decontaminated each day and no such equipment is reused before being decontaminated. Microliter size subsampling syringes are reused only after a nitrogen carrier gas blank is run to insure it is not contaminated by the previous sample.

APPENDIX A: CONDENSED DATA

WARZYN ENGINEERING/ACS/GRIFFITH, INDIANA JOB#1-90-155-S
03-26-90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	THC ug/l
AIR	<0.04	<0.1	<0.2	<0.5	<0.4
GW1-6'	26	32	38	40	140
GW1-11'	1200	94	51	53	3600
GW1-15'	990	25	<2	<5	3000
GW2-6'	68	28	20	8	160
GW2-11'	440	<2	<2	<2	600
GW2-14'	1100	17	<2	540	2100
GW3-6'	<0.2	<0.3	<0.3	<0.4	<1
GW3-11'	<0.2	<0.3	<0.3	<0.4	<1
GW3-14'	<0.2	<0.3	<0.3	<0.4	<1
AIR	2	3	<0.3	<0.4	8

Analyzed by: P. Reko
Checked by: A. Hooper
Proofed by: L. Laplander

WARZYN ENGINEERING/ACS/GRIFFITH, INDIANA JOB#1-90-155-S
03-27-90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	THC ug/l
AIR	<0.3	<0.3	<0.3	<0.5	<1
GW4-12'	61	2	<0.8	<1	84
GW5-12'	6	<0.3	<0.3	<0.5	10
GW6-5'	<0.3	0.3	<0.3	<0.5	2
GW6-10'	0.2	<0.3	<0.3	<0.5	0.8
GW6-14'	0.5	<0.3	<0.3	<0.5	1
GW7-6'	<0.3	0.3	<0.3	<0.5	0.7
AIR	<0.3	<0.3	<0.3	<0.5	<1
GW8-6'	<0.3	0.2	<0.3	<0.5	1
GW8-10'	<0.3	<0.3	<0.3	<0.5	<1
GW8-14'	<0.1	<0.2	<0.2	<0.3	<0.7
GW9-7'	6900	<6	<6	<11	8800
GW9-12'	5300	<6	<6	<11	6700
GW10-7'	27000	18000	<6	530	54000
GW10-12'	16000	13000	<32	970	34000
GW11-10'	62	<3	<3	<5	300
GW12-10'	170	<3	<3	<5	220
AIR	<0.3	<0.3	<0.3	<0.5	<1

Analyzed by: P. Reko
Checked by: A. Hooper
Proofed by: L. Laplander

Tracer Research Corporation

WARZYN ENGINEERING/ACS/GRIFFITH, INDIANA JOB#1-90-155-S
03-28-90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	THC ug/l
AIR	0.1	0.2	<0.1	<0.2	0.5
GW13-7'	<0.1	0.2	<0.1	<0.2	0.5
GW13-13'	<0.1	0.2	<0.1	<0.2	0.5
GW14-7'	0.2	0.2	<0.1	<0.2	4
GW14-12'	1	0.1	<0.1	<0.2	4
GW15-7'	0.2	<0.1	<0.1	<0.2	0.6
GW15-12'	5200	<1	<1	<2	6200
GW16-12'	4300	<1	<1	<2	4900
AIR	<0.1	<0.1	<0.1	<0.2	<0.5
GW17-12'	<0.1	<0.1	<0.1	<0.2	<0.5
GW18-12'	0.1	<0.1	<0.1	<0.2	0.5
GW19-12'	<0.1	<0.1	<0.1	<0.2	<0.5
GW20-9'	6	<0.1	<0.1	<0.2	6
GW20-14'	200	<0.2	<0.2	<0.4	220
GW21-13'	<0.2	<0.2	<0.2	<0.4	<1
GW22-13'	780	5	<0.2	<0.4	900
GW23-13'	940	<1	<1	<2	1100
AIR	0.4	0.4	<0.1	<0.2	1

Analyzed by: P. Reko
Checked by: A. Hooper
Proofed by: L. Laplardu

WARZYN ENGINEERING/ACS/GRIFFITH, INDIANA JOB#1-90-155-S
03-29-90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	THC ug/l
AIR	0.8	1	<0.1	1	3
GW24-11'	12000	<2	<2	<4	20000
GW25-11'	<0.1	<0.1	<0.1	<0.2	<0.5
GW26-11'	1	<0.1	<0.1	<0.2	3
GW27-11'	7400	5	<1	<2	15000
GW28-11'	<0.1	<0.1	<0.1	<0.2	<0.5
AIR	<0.1	<0.1	<0.1	<0.2	<0.5

Analyzed by: P. Reko
Checked by: A. Hooper
Proofed by: L. Lopander

WARZYN ENGINEERING/ACS/GRIFFITH, INDIANA JOB#1-90-155-S
04-02-90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	THC ug/l
AIR	<0.1	<0.2	<0.2	<0.3	<0.7
GW29-10'	<0.1	0.1	<0.2	<0.3	<0.7
GW30-10'	2	<0.2	<0.2	<0.3	2
GW31-12'	6	0.3	<0.4	<0.6	8
GW32-12'	30	<0.3	<0.4	1	210
AIR	<0.1	0.1	<0.2	<0.3	<0.7
GW33-9'	27000	7	<4	4900	37000
GW34-9'	2600	<2	<2	<3	3300
GW35-9'	3800	11000	<2	10000	23000
GW36-11'	25000	<2	<2	<3	32000
GW37-11'	7	<0.8	<0.9	<1	9
GW38-12'	8	<0.4	<0.4	<0.7	10
AIR	0.3	0.3	<0.2	<0.3	1

Analyzed by: P. Reko
Checked by: A. Hooper
Proofed by: L. Laplander

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Research
Corporation

FIELD LOGBOOK

WARZYN ENGIN. IN:

CLIENT American Chemical Services

SITE

LOCATION Griffith, IN

DATES 3-26-90

1-90-155-S

Tracer Research Corporation

VAN # 3
PLATE # 3NR 132

SOIL GAS INVESTIGATION BACKGROUND INFORMATION

SITE NAME: American Chemical Services
LOCATION: 420 S. Colfax Ave. Griffith, IN 46319
DATES OF INVESTIGATION: 3-26-90 ↔
CLIENT NAME & ADDRESS: Warzyn Engineering Inc
Chicago Ill

FIELD REPRESENTATIVE(S) FOR CLIENT: Tim Maley

PERSON TO WHOM REPORT AND QUESTIONS
SHOULD BE DIRECTED: Dr. Peter Vagt
PHONE: (708) 691-3058
CREW: CHEMIST Pete Rorks GEOLOGIST Andy Hopper

REPORT TO INCLUDE (CIRCLE):
A. QA/QC-PROCEDURES-DATA ONLY or
B. FULL REPORT WITH CONTOUR MAPS AND INTERPRETATION

PURPOSE OF INVESTIGATION

Find extent of contamination, eg locate outside edges of plume

TARGET VOCs

BTEX Total Hydrocarbons

GROUNDWATER INFORMATION: 1' to 8'

DEPTH TO WATER: ~~1'~~ variable DIRECTION: Variable

SOURCES OF CONTAMINATION

Unknown

GEOLOGIC SETTING: (e.g. soil type, subsurface geology, etc.)

Fine Sand

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S I T E M A P

SITE MAPS TO INCLUDE: SITE NAME, SCALE, NORTH ARROW, SOIL GAS LOCATIONS & NUMBERS, CULTURAL AND NATURAL FEATURES TO IDENTIFY SITE.

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DATE : 3/26/90
LOCATION : Griffith, Indiana
CLIENT : WARZYN ENGINEERING

GC Operator: PETE REKO
Weather : clear, cold, windy

Field Assistant: Andy Hooper

FIELD HOURS

A Time on site	: 8:00	Lunch hours	: 1.0
B Time off site	: ~~5:00~~ 17:00	Downtime hours[1]	: —
		Standby hours[2]	: —
Hours on site (B - A)	: 9:00		

DECONTAMINATION

Probe Decontamination

Total hours: 1/2

Verified by GC operator

Syringe Decontamination

Total hours : 1/2

Verified by field assistant

DAILY SUMMARY

Calibration

Time start : 9:30
Time end : 10:30
Total hours: 1

Sampling

Max vacuum : 26 in Hg
Probes used : 5
Points used : 7
Soil gas samples collected : 0
Water samples collected : 7

Analysis

Total system blanks : 1
Total air samples : 2

Field data and gas standards checked by _____

Verified by Client

Data checking hours:

1 - Downtime includes time spent repairing sampling & analytic equipment; note times and explanation on following field data pages

2 - Standby includes time available for sampling but waiting for client; note times and explanation on following field data pages

Tracer Research Corporation

DATE: 3/26/90
LOCATION: Griffith, Ind. CLIENT: WARZYN ENG

SL 130
240 52

SAMPLING DATA

TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT #	PROBE PUSH/ POUND	VAC(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: 8:00										
BEGIN CALIBRATION: 9:30										
	AIR BLK									
11:25	GW-1	6'	A	N1	Push 6'	-	-	40 ml	1	GROUNDWATER Reddish Brown CLOUDY, Moderate particulates
12:00	GW-1	11'	B	N2	Push 11'	-	-	35 ml	1	Grayish Brown, CLOUDY, heavy particulates, hydrocarbon odor
12:40	GW-1	15'	A+ B	N3	Push 7 Pound 4	-	-	20 ml	1	Same as at 11'
14:22	GW-2	6'	C	N4	Push 6'	-	-	30 ml	1	light brown, cloudy, few particulates no noticeable odor
14:50	GW-2	11'	D	N5	Push 11'	-	-	20 ml	1	GRY, cloudy, moderate puff, no odor
15:30	GW-2	14'	D	N6	Push 3'	-	-	30 ml	1	~~As~~ Same as 11'
16:20	GW-3	11'	E	N7	Push 11'	-	-	20 ml	1	light Brow, Cloudy, few part., no

Tracer Research Corporation

DATE : 3/27/90
LOCATION : Griffith, Ind
CLIENT : WARZYN

GC Operator: PETE REKO
Weather : Clear, cool

Field Assistant: Andy Hooper

FIELD HOURS

A Time on site : 8:10
B Time off site : ~~17:45~~ 18:00

Hours on site (B - A) : ~~9.6~~ 9.85

Lunch hours : 1
Downtime hours[1] : —
Standby hours[2] : —

DECONTAMINATION

Probe Decontamination

Total hours: ½

Peter Reko
Verified by GC operator

Syringe Decontamination

Total hours : ½

Andy Hooper
Verified by field assistant

DAILY SUMMARY

Calibration

Time start : 8:15
Time end : 9:30

Total hours: 1.25

Sampling

Max vacuum : 26 in Hg
Probes used : 15
Points used : 15
Soil gas samples collected : 0
Water samples collected : 15

Analysis

Total system blanks : 1
Total air samples : 3

Field data and gas standards checked by _____

Verified by Client

Data checking hours:

1 - Downtime includes time spent repairing sampling & analytic equipment; note times and explanation on following field data pages
2 - Standby includes time available for sampling but waiting for client; note times and explanation on following field data pages

Tracer Research Corporation

DATE: 3/27/90
LOCATION: Griffith, Ind
CLIENT: WARZYN

SAMPLING DATA

TIME	SAMPLE NUMBER	DEPTH	PROBE #	ADAPT #	PROBE PUSH/ POUND	Vac (in Hg)	EVAC TIME (s)	SAMPLE VOL (cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: 8:10 BEGIN CALIBRATION: 8:15										
9:40	GW-4	12	A	N_1	push 12'	-	-	30 ml	1	Grey, cloudy, HP, No odor
9:54	GW-5	12	B	N_2	push 12'	-	-	20 ml	1	Same as GW-4
10:25	GW-6	6'	C	N_3	push 6'	-	-	20 ml	1	
10:35	GW-6	10'	D	N_4	push 10'	-	-	20 ml	1	Dark Brown, cloudy, MP, NO
10:44	GW-6	14'	e	N_5	push 4'	-	-	30 ml	1	light Brown, cloudy, MP
11:30	GW-7	6'	f	N_6	push 6'	-	-	20 ml	1	light Brown, cloudy, MP
14:00	GW-8	6'	g	N_7	push 6'	-	-	20 ml	1	light Brown & cloudy, MP, NO
14:10	GW-8	10'	h	N_8	push 10	-	-	20 ml	1	Gray & cloudy, MP, NO
14:20	GW-8	14'	I	N_9	push 4'	-	-	20 ml	1	Grayish brown, cloudy, black s
15:40	GW-9	7'	J	N_{10}	push 7'	-	-	20 ml	1	light Brown, cloudy, MP
15:55	GW-9	14'	K	N_{11}	push 4' pound 3	-	-	20 ml	1	light brown, Cloudy, MP
16:15	GW-10	7'	L	N_{12}	push 7			20 ml	1	light brown
16:30	GW-10	14'	M	N_{13}	push 14'	-		20 ml	1	light brown
17:00	GW-11	10'	N	N_{14}	push 10'			20 ml	1	light brown

Tracer Research Corporation

DATE:
LOCATION: CLIENT:

SAMPLING DATA										
TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT#	PROBE PUSH/ POUND	VAC(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE:										
BEGIN CALIBRATION:										
17:15	GW-12	10'	0	N ~5	Push 10'	-	-	20	1	Light brown

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DATE:
LOCATION:

CLIENT:

N O T E S

stuck in mud for 20 minutes
waited for client ½ hour (to show up)
after lunch

Tracer Research Corporation

DATE : 3/28/90
LOCATION : Griffith, Ind
CLIENT : Warzyn, GNC

GC Operator: Pete Reko
Weather :

Field Assistant: Andy Harper

FIELD HOURS

A Time on site : 8:10
B Time off site : 18:00

Hours on site (B - A) : 9.83

Lunch hours : 1
Downtime hours[1] : —
Standby hours[2] : —

DECONTAMINATION

Probe Decontamination

Total hours: .25

Verified by GC operator

Syringe Decontamination

Total hours : ½

Verified by field assistant

DAILY SUMMARY

Calibration

Time start : 8:20
Time end : 9:10

Total hours:

Sampling

Max vacuum : 26 in Hg
Probes used : 15
Points used : 15
Soil gas samples collected : 0
Water samples collected : 15

Analysis

Total system blanks : 1
Total air samples : 3

Field data and gas standards checked by _____

Verified by Client

Data checking hours:

1 - Downtime includes time spent repairing sampling & analytic equipment; note times and explanation on following field data pages
2 - Standby includes time available for sampling but waiting for client; note times and explanation on following field data pages

Tracer Research Corporation

DATE: 3/28/90
LOCATION: Griffith, Ind. CLIENT: WARZYN

SAMPLING DATA

TIME	SAMPLE NUMBER	DEPTH	PROBE #	ADAPT #	PROBE PUSH/ POUND	VAC (in Hg)	EVAC TIME (s)	SAMPLE VOL (cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: 8:10										
BEGIN CALIBRATION: 8:20										
9:22	GW-13	7'	1	1	push 7	—		20 ml	1	Dark Brown, MP
9:30	GW-13	~~14'~~ 13'	2	2	push 6	—		20 ml	1	Dark Brown, MP
9:50 ~~10:20~~	GW-14	7	3	3	push 7	—		20 ml	1	Dark Brown, MP
10:00	GW-14	12	4	4	push 5	—		20	1	Dark Brown, MP
10:40	GW-15	9	5	5	push 7	—		20	1	Light Brown, MP
10:50	GW-15	12	6	6	push 5	—		20	1	Dark Brow, HP, Grey Silt
11:30	GW-16	12	7	7	push 12	—		20	1	~~Grey, Cloudy, HP, Grey Silt~~
13:40	GW-17	12	8	8	push 8 Pound 4'	—		30 ml	1	Grey, cloudy, HP, Grey Silt
14:00	GW-18	12	9	9	push 8 pound 4'	—		35 ml	1	same as GW-17
~~15:00~~ 14:30	GW-19	~~14~~ 12	10	10	push 12'	—		35 ml	1	Tan colored, slightly cloudy, No particu
15:00	GW ~~19~~ 20	~~11~~ 9	11	11	push 9'	—		20 ml	1	Grey, HP, Grey Silt
15:10	GW-20	14	12	12	push 14'	—		20 ml	1	Grey, HP, Grey Silt
15:45	GW-21	13	13	13	push pound 3'	—		30 ml	1	
16:10	GW-22	13	14	14	pound 3'	—		30 ml	1	

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DATE:
LOCATION:

CLIENT:

N O T E S

GW-1

GW-15

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DATE:
LOCATION: CLIENT:

SAMPLING DATA										
TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT#	PROBE PUSH/ POUND	VAC(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: BEGIN CALIBRATION:										
5:20	GW-23	13'	15	15	Pound 13'	-	-	40 mL	1	

Tracer Research Corporation

DATE : 3/29/90
LOCATION : GRIFFITH, IND
CLIENT : WARZYN

GC Operator: P. ROKO
Weather : cold & Rainy

Field Assistant: A. Hooper

FIELD HOURS

A Time on site : 8:30
B Time off site : ~~7~~ 17:45

Hours on site (B - A) : ~~8.75~~ 9.25

Lunch hours : 1
Downtime hours[1] : —
Standby hours[2] : —

DECONTAMINATION

Probe Decontamination

Total hours: 0

Verified by GC operator

Syringe Decontamination

Total hours : 1/2

Verified by field assistant

DAILY SUMMARY

Calibration

Time start : 8:30
Time end : 9:30

Total hours: 1

Sampling

Max vacuum : 26 in Hg
Probes used : 5
Points used : 5
Soil gas samples collected : 0
Water samples collected : 5

Analysis

Total system blanks : 1
Total air samples : 2

Field data and gas standards checked by _____

Verified by Client

Data checking hours:

1 - Downtime includes time spent repairing sampling & analytic equipment; note times and explanation on following field data pages
2 - Standby includes time available for sampling but waiting for client; note times and explanation on following field data pages

Tracer Research Corporation

DATE: 3/29/90
LOCATION: GRIFFITH, IND

CLIENT: WARZYN

SAMPLING DATA

TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT#	PROBE PUSH/ POUND	VAC(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: 8:30										
BEGIN CALIBRATION: 8:30										
10:00	GW-24	11'	1	1	pound 11'	—		30 ml	1	
11:15	GW-25	11'	2	2	pound 11'	—		30 ml	1	
12:06	GW-26	11'	3	3	pound 11	—		30 ml	1	
1 4:30	GW-27	11'	4	4	pound 11'			30 ml	1	
1 5:30	GW-28	11'	5	5	pound 11'			30 ml	1	

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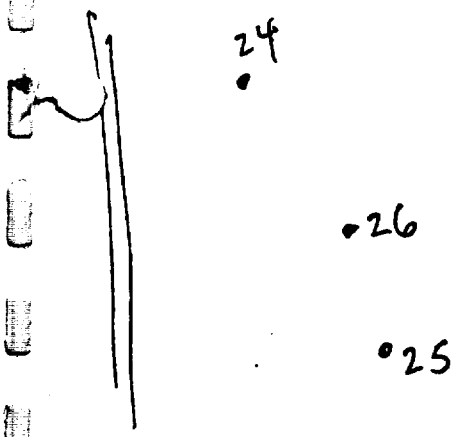
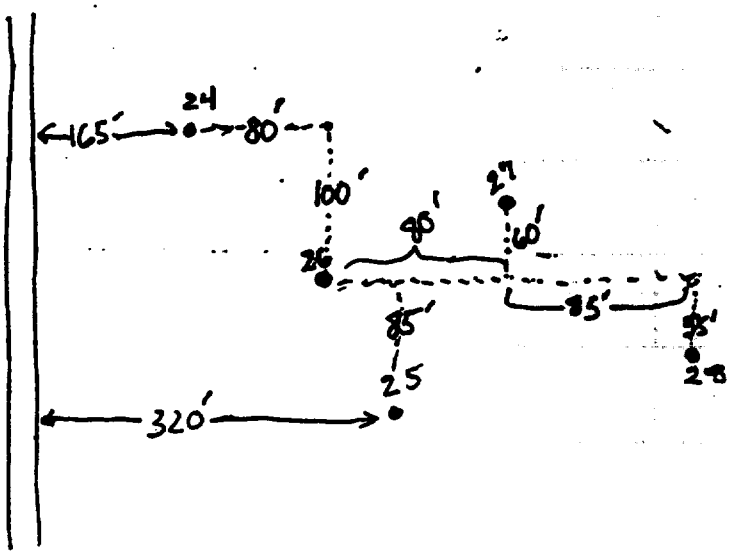
DATE:
LOCATION:

CLIENT:

N O T E S

waited 1 hr. after lunch for client.
stuck on train track rail, from about
3:30pm to 4:00pm





Tracer Research Corporation

DATE:
LOCATION: CLIENT:

SAMPLING DATA										
TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT#	PROBE PUSH/ POUND	Vac(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: BEGIN CALIBRATION:										

Tracer Research Corporation

DATE: 4/2/90
LOCATION: Griffith, Ind.

CLIENT: WARZYO ENG.

SAMPLING DATA										
TIME	SAMPLE NUMBER	DEPTH	PROBE #	ADAPT #	PROBE PUSH/ POUND	VAC (in Hg)	EVAC TIME (s)	SAMPLE VOL (cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: 9 BEGIN CALIBRATION: 9:10										
10:35	GW-29	10'	1	1	push 10'	—	—	20ml	1	light Brown, MP, Dark Brown Silt No odor
10:50	GW-30	16'	2	2	push 10'	—	—	20ml	1	light Brown, Same as GW-29
11:15	GW-31	12'	3	3	push 12'	—	—	20ml	1	Dark grey, HP, No odor
11:35	GW-32	12'	4	4	push 12'	—	—	30ml	1	Orange w/ orange Silt
13:40 ~~11:00~~	GW-33	9'	5	5	push 9	—	—	20ml	1	Grey w/ grey silt
14:00	GW-34	9'	6	6	push 9	—	—	30ml	1	light brown, HP
14:30	GW-35	9'	7	7	push 9	—	—	20ml	1	
15:30	GW-36	11'	8	8	~~push~~ pound 11'	—	—	30ml	1	
16:00	GW-37	11'	9	9	pound 11'	—	—	30ml	1	Grey w/ Grey Silt
17:30	GW-38	12'	10	10	push 12'	—	—	30ml	1	

Tracer Research Corporation

DATE: 4/2/90
LOCATION: Griffith, Ind.

CLIENT: WARZYD ENG.

SAMPLING DATA

TIME	SAMPLE NUMBER	DEPTH	PROBE #	ADAPT #	PROBE PUSH/ POUND	Vac (in Hg)	EVAC TIME (s)	SAMPLE VOL (cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: 9 BEGIN CALIBRATION: 9:10										
10:35	GW-29	10'	1	1	push 10'	—	—	20ml	1	light Brown, MP, Dark Brown Silt No odor
10:50	GW-30	16'	2	2	push 10'	—	—	20ml	1	light Brown, Same as GW-29
11:15	GW-31	12'	3	3	push 12'	—	—	20ml	1	Dark grey, HP, No odor
11:35	GW-32	12'	4	4	push 12'	—	—	30ml	1	Orange w/ orange Silt
13:40 ~~14:00~~	GW-33	9'	5	5	push 9	—	—	20ml	1	Grey w/ grey Silt
14:00	GW-34	9'	6	6	push 9	—	—	30ml	1	light brown, HP
14:30	GW-35	9'	7	7	push 9	—	—	20ml	1	
15:30	GW-36	11'	8	8	~~push~~ pound 11'	—	—	30ml	1	
16:00	GW-37	11'	9	9	pound 11'	—	—	30ml	1	Grey w/ Grey Silt
17:30	GW-38	12'	10	10	push 12'	—	—	30ml	1	

APPENDIX K

Field Parameter Results

TABLE
Groundwater Field Parameters
American Chemical Service NPL Site
Remedial Investigation
Griffith, Indiana

WELL #	Phase I Round I (Aug 89)	Phase II Round I (May 90)	Phase II Round II (Jul 90)
MW01			
pH	6.83		
Conductivity (umhos)	750		
Temperature (C)	17.4		
Dissolved Oxygen (mg/l)			
Red/Ox Potential (mV)			
MW02			
pH	6.74	6.90	
Conductivity (umhos)	620	710	
Temperature (C)	18.9	13.0	
Dissolved Oxygen (mg/l)			1.3
Red/Ox Potential (mV)			-36
MW03			
pH	6.14	6.54	
Conductivity (umhos)	1150	1020	
Temperature (C)	19.4	11.5	
Dissolved Oxygen (mg/l)			2.2
Red/Ox Potential (mV)			-78
MW04			
pH	6.48	6.54	
Conductivity (umhos)	1490	1600	
Temperature (C)	19.6	12.0	
Dissolved Oxygen (mg/l)			2.0
Red/Ox Potential (mV)			-40
MW05			
pH	7.04	6.58	
Conductivity (umhos)	1075	2180	
Temperature (C)	18.3	11.4	
Dissolved Oxygen (mg/l)			2.5
Red/Ox Potential (mV)			-91
MW06			
pH	6.49	6.67	
Conductivity (umhos)	1050	1580	
Temperature (C)	15.2	11.9	
Dissolved Oxygen (mg/l)			2.4
Red/Ox Potential (mV)			-25

TABLE (con't)
Groundwater Field Parameters
American Chemical Service NPL Site

WELL #	Phase I Round I (Aug 89)	Phase II Round I (May 90)	Phase II Round II (Jul 90)
MW07			
pH		7.37	8.21
Conductivity (umhos)		312	345
Temperature (C)		12.5	12.8
Dissolved Oxygen (mg/l)			1.5
Red/Ox Potential (mV)			173
MW08			
pH		6.77	7.99
Conductivity (umhos)		337	335
Temperature (C)		11.4	11.5
Dissolved Oxygen (mg/l)			2.5
Red/Ox Potential (mV)			161
MW09			
pH		6.67	7.35
Conductivity (umhos)		950	800
Temperature (C)		11.5	13.6
Dissolved Oxygen (mg/l)			3.5
Red/Ox Potential (mV)			12
MW10			
pH		7.20	7.59
Conductivity (umhos)		1750	956
Temperature (C)		11.9	14.9
Dissolved Oxygen (mg/l)			4.5
Red/Ox Potential (mV)			72
MW10C			
pH			7.10
Conductivity (umhos)			2000
Temperature (C)			14.4
Dissolved Oxygen (mg/l)			3.0
Red/Ox Potential (mV)			-38
MW11			
pH		6.83	6.91
Conductivity (umhos)		340	340
Temperature (C)		14.0	14.2
Dissolved Oxygen (mg/l)			1.8
Red/Ox Potential (mV)			78
MW12			
pH		6.78	6.68
Conductivity (umhos)		420	460
Temperature (C)		12.0	14.5
Dissolved Oxygen (mg/l)			2.1
Red/Ox Potential (mV)			17

TABLE (con't)
Groundwater Field Parameters
American Chemical Service NPL Site

WELL #	Phase I Round I (Aug 89)	Phase II Round I (May 90)	Phase II Round II (Jul 90)
MW13			
pH		7.02	7.15
Conductivity (umhos)		940	675
Temperature (C)		15.0	15.0
Dissolved Oxygen (mg/l)			2.5
Red/Ox Potential (mV)			195
MW14			
pH		6.53	6.79
Conductivity (umhos)		320	650
Temperature (C)		13.0	11.0
Dissolved Oxygen (mg/l)			4.0
Red/Ox Potential (mV)			166
MW15			
pH		7.41	7.19
Conductivity (umhos)		1830	250
Temperature (C)		14.0	17.0
Dissolved Oxygen (mg/l)			1.6
Red/Ox Potential (mV)			84
MW16			
pH		6.51	6.33
Conductivity (umhos)		5300	5000
Temperature (C)		14.0	13.5
Dissolved Oxygen (mg/l)			1.2
Red/Ox Potential (mV)			-35
MW17			
pH		6.57	6.67
Conductivity (umhos)		520	300
Temperature (C)		11.3	12.0
Dissolved Oxygen (mg/l)			3.5
Red/Ox Potential (mV)			102
MW18			
pH			6.97
Conductivity (umhos)			500
Temperature (C)			18.4
Dissolved Oxygen (mg/l)			4.8
Red/Ox Potential (mV)			256

Table

Summary of Field Parameters
American Chemical Services NPL Site
Remedial Investigation, Phase I

Landfill Leachate Field Parameters

Sample #	Date	pH	Temp (°C)	Conductivity (umhos)
LW-01-01	7/27/89	7.54	17.0	3300
LW-02-01	7/28/89	6.86	15.6	3275
LW-03-01	7/28/89	6.70	18.0	8000
LW-04-01	7/27/89	6.75	16.0	5200

Surface Water Field Parameters

Sample #	Date	pH	Temp (°C)	Conductivity (umhos)
SW01-01	7/21/89	7.32	25.1	720
SW02-01	7/21/89	7.92	25.0	68
SW05-01	7/20/89	7.34	19.0	1500
SW-07A-01	7/25/89	7.44	29.4	800
SW-08-01	7/24/89	6.26	27.1	150

Private Well Field Parameters

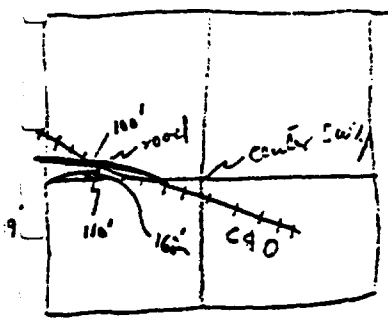
Well #	Date	pH	Temp (°C)	Conductivity (umhos)
PW01-01	6/13/90	7.44	14.3	600
PW02-01	6/13/90	7.36	14.6	750
PW03-01	6/13/90	7.43	15.0	700
PW04-01	6/13/90	7.34	13.5	625
PW05-01	6/14/90	7.34	14.4	700
PW06-01	6/14/90	7.43	14.7	1200
PW07-01	6/14/90	7.38	15.1	1100
PW08-01	6/14/90	7.42	17.9	550

Effluent Water Sample Field Parameters

Sample #	Date	pH	Temp (°C)	Conductivity (umhos)
AE01-01	11/15/89	8.72	6.1	75
AE02-01	11/15/89	8.82	7.8	52
AE03-01	11/15/89	8.77	8.4	96
AE04-01	11/15/89	8.72	9.3	99

APPENDIX L

Private Well Logs



35/9W-1m1 (1)

DIVISION OF WATER RESOURCES
INDIANA DEPARTMENT OF CONSERVATION
311 WEST WASHINGTON STREET
INDIANAPOLIS, INDIANA

Water sample collected by Ron Weiss SBH

595450

WATER WELL RECORD 465575

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: St John

Congressional township: 35N Range: 9W Number of section: 1

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: one half mile east of Griffith on county road P3

1048 Reder St. Griffith

Name of owner: Slyvester Reder Address:

Name of Well Drilling Contractor: Joe Eich and Son

Address: 1601 W. 57th Gary Ind.

Name of Drilling Equipment Operator: John R. Eich

INFORMATION ON THE WELL

Completed depth of well: 55 ft. Date well was completed: May 3 1960

Diameter of outside casing or drive pipe: 2" Length: 52

Diameter of inside casing or liner: Length:

Diameter of Screen: 1" Length: 54" 4½' Slot size: 60 mesh

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other

Use of Well: For home ☒ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Driven ☐

Static water level in completed well (Distance from ground to water level) 25 ft.

Bailer Test: Hours tested ____ Rate ____ g.p.m. Drawdown ____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 15 g.p.m. Drawdown ____ ft.

Signature William E. Eich

Date June 21, 1960

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(1)

WATER WELL LOG

ORMATIONS (Color, type of material, hardness, etc.)	From	To
brown sand ✓	0	17
blue clay	17	26
fine s nd and gravel ✓	26	33
blue clay	33	39
coarse sand ✓	39	56

EMARKS:

FOR ADMINISTRATIVE USE ONLY
(Well Driller does not fill out)

COUNTY: Lake TWP. 35N RGE. 9W SW ¼ NW ¼ SW ¼ SEC. 1

Topo. Map: 1/4/4 Loc. accepted w/o verification Yes ___ No ___

El. of grnd. surface at well: 635 Courthouse Loc. ✓ By ___ Date 11-15-61

Depth to bedrock: ___ Field Located By Bowkins Date 15SH 8/12/81

Well Log processed by: ___ Placed in Master Well Log File Date ___

100 E of W
500 N of SE

580 - Aquifer Elev. GW Strategy Project - ISGH

635

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a ter well. We request that you be as accurate as possible in recording this information, as may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. ease include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted thin thirty days after the completion of a well to the Division of Water Resources, Indiana partment of Conservation, 311 West Washington Street, Indianapolis, Indiana.

(2)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204

Telephone 317-232-4160

596580
466660

WATER WELL RECORD

State Form 35680

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake County Civil Township Ross Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER ~~and/or BUILDING~~ CONTRACTOR

Well Owner H+N Airport Address 701 E. Main St - Griffith - Ind. 46322

Building Contractor _____ Address _____

Name of Well Drilling Contractor John Farmer + Son Well + Pump Service Inc -

Address 9703 Kennedy Avenue - Highland - Indiana 46322

Name of Drilling Equipment Operator: Everett H. Farmer

WELL INFORMATION

Depth of well: 65 ft Date well was completed: June 4-1984

Diameter of casing or drive pipe: 4" Total Length: 59 ft.

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 4" Length: 6 ft Slot Size: .006

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☐ For Industry ☐ For Public Supply (Bathrooms) ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☑ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) _____ feet

Bailer Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft.

Pumping Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Arlene S. Gagliardi - Secretary

Date _____

(2)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY _____ TWP. 35N RGE. 91W NE ¼ NW ¼ NE SEC 1 Subdivision Name

Topo Map _____ 1600 Ft W of EL. Ground Elevation ~~635~~ 634

Field Located By DTK Date 7/30/86 _____ Ft N of SL. Depth to bedrock _____

Courthouse Location By _____ Date _____ _____ Ft E of WL. Bedrock elevation _____

Location accepted w/o verification by _____ 100 Ft S of NL. Aquifer elevation 570 Lot Number _____

Well is on west side of shop. / Worker verified well location.

WWDC

WATER WELL LOG

To	From	FORMATIONS (Color, type of material, hardness, etc.)
19	0	Dirty sand
41	19	Clay
54	43	Fine sand
65	54	Medium sand

Telephone 633-5267 Area Code 317

(3)

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Ken Foundreys Address Main St. - Griffith, Indiana

Building Contractor _____ Address _____

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service Inc.

Address 9703 Kennedy Ave. - Highland, Indiana 46322

Name of Drilling Equipment Operator: Jared Farmer

WELL INFORMATION

Depth of well: 63 ft. Date well was completed: Oct. 26-1971

Diameter of casing or drive pipe: 4" Total Length: 55'

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 3 Length: 8 Slot Size: 08

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☑ For Industry ☒ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 17 feet

Bailer Test: Hours Tested 4 Rate 40 g.p.m. _____ Drawdown 15 ft.

Pumping Test: Hours Tested 4 Rate 30 g.p.m. _____ Drawdown 10 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Adelmar S. Gagliardi

Date Nov. 29-1971

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(3)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

Kleen Freeway

COUNTY _____ TWP. 36N RGE. 9W ¼ _____ ¼ NE SEC 2 Subdivision Name _____

Topo Map _____ Ft W of EL. _____ Ground Elevation _____

Field Located By _____ Date _____ Ft N of SL. _____ Depth to bedrock _____

Courthouse Location By _____ Date _____ Ft E of WL. _____ Bedrock elevation _____

Location accepted w/o verification by _____ Ft S of NL. _____ Aquifer elevation _____ Lot Number _____

To	From	FORMATIONS (Color, type of material, hardness, etc.)
2	0	Soil
17	2	Dirty Sand
42	17	Clay
52	42	Clay & Shale
63	52	Clean Sand

INDIANAPOLIS 9, INDIANA

(4)

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: LAKE Civil Township: _____

Congressional township: _____ Range: _____ Number of section: _____

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: GRIFFITH, IND.

Name of owner: KEEN FOUNDRY Address: GRIFFITH, IND.

Name of Well Drilling Contractor: SHEEHY WELL + PUMP CO.

Address: RR2 BOX 1 CEDAR LAKE, IND

Name of Drilling Equipment Operator: DOUG SHEEHY

INFORMATION ON THE WELL

Completed depth of well: 81 ft. Date well was completed: JUNE 28 1967

Diameter of outside casing or drive pipe: 8" Length: 81'

Diameter of inside casing or liner: 4" Length: 76'

Diameter of Screen: 8" Length: 29' Slot size: 0018

Type of Well: Drilled ☐ Gravel Pack ☒ Driven ☐ Other _____

Use of Well: For home ☐ For industry ☒ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☒ Rev. Rotary ☐ Jet ☐ Driven ☐

Static water level in completed well (Distance from ground to water level) 18' ft.

Bailer Test: Hours tested 2 Rate 10 g.p.m. Drawdown 15 ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 4 Rate 125 g.p.m. Drawdown 58 ft.

Signature [illegible]

Date JUNE 28, 1967

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(4)

FOR INDIANA GEOLOGICAL SURVEY USE ONLY
(Well Dri[illegible] does not fill out)

COUNTY: [illegible] TWP. [illegible] RGE. [illegible] ¼ ¼ ¼ SEC. 2

Topo Map: Rhodhamel Loc. accepted w/o verification Yes ___ No ___

Well log classified By [illegible] Date ___ Ground elevation ___ Ft W of EL
Courthouse located By ___ Date ___ Depth to bedrock ___ Ft N of SL
Field located By ___ Date ___ Bedrock elevation ___ Ft E of WL
Placed in master well log file Date ___ Aquifer elevation ___ Ft S of NL

[illegible], thickness, etc.)	From	To
Sing + Cobb (Fill)	0	8
Sand	8	23
Blue Clay	[illegible]	[illegible]
Sand (Fine)	[illegible]	81

REMARKS:

INSTRUCTIONS

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An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation.

INDIANAPOLIS, INDIANA

(5)

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: _____

Congressional township: _____ Range: _____ Number of section: _____

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: _____

Name of owner: Mr. Pinkstaff Address: 743 S. Cline Ave. Griffith Ind.

Name of Well Drilling Contractor: John Farmer

Address: [redacted]

Name of Drilling Equipment Operator: [redacted]

INFORMATION ON THE WELL

Completed depth of well: 69 ft. Date well was completed: Dec. 5-1959

Diameter of outside casing or drive pipe: 2" Length: 21 ft

Diameter of inside casing or liner: _____ Length: _____

Diameter of Screen: 1" Length: 4 ft Slot size: 60

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☑ Other _____

Use of Well: For home ☑ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Driven ☐

Static water level in completed well (Distance from ground to water level) _____ ft.

Bailer Test: Hours tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 15 g.p.m. Drawdown _____ ft.

Signature John Farmer - Wilma Farmer

Date Jan. 4-1960

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

FOR ADMINISTRATIVE USE ONLY
(Well Driller does not fill out)

NTY: Lake TWP. 35N RGE. 9W ___ ¼ ___ ¼ ___ ¼ SEC. ___

o. Map: Highland 7½' Loc. accepted w/o verification Yes ___ No ___

of grnd. surface at well: ___ Courthouse Loc. By ___ Date ___

th to bedrock: ___ Field Located By ___ Date ___

l Log processed by: ___ Placed in Master Well Log File Date ___

REMARKS:

INSTRUCTIONS

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As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation, 311 West Washington Street, Indianapolis, Indiana.

311 WEST WASHINGTON STREET
INDIANAPOLIS, INDIANA

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: _____

Congressional township: _____ Range: _____ Number of section: _____

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: _____

Name of owner: Mr. Van Flick Address: 1523 E. Elm St. Griffith

Name of Well Drilling Contractor: John Farmer

Address: 2130-45th Street

Name of Drilling Equipment Operator: Paul Kibbert

INFORMATION ON THE WELL

Completed depth of well: 50 ft. Date well was completed: Nov. 5-1959

Diameter of outside casing or drive pipe: 2" Length: 21 ft

Diameter of inside casing or liner: _____ Length: _____

Diameter of Screen: 1" Length: 4 ft Slot size: 60

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☑ Other _____

Use of Well: For home ☑ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Driven ☐

Static water level in completed well (Distance from ground to water level) _____ ft.

Bailer Test: Hours tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 15 g.p.m. Drawdown 12 ft.

Signature John Farmer - A.J. Su

Date Nov. 14-1959

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(6)

FOR ADMINISTRATIVE USE ONLY
(Well Driller does not fill out)

COUNTY: Lake TWP. 36 N RGE. 9W ¼ ¼ ¼ ¼ SEC. 36

Topo. Map: Highland 2 ½ Loc. accepted w/o verification Yes ___ No ___

El. of grnd. surface at well: ___ Courthouse Loc. By ___ Date ___

Depth to bedrock: ___ Field Located By ___ Date ___

Well Log processed by: ___ Placed in Master Well Log File Date ___

ORMATIONS (Color, type of material, hardness, etc.)	From	To

REMARKS:

INSTRUCTIONS

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An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation, 311 West Washington Street, Indianapolis, Indiana.

INDIANAPOLIS, INDIANA

(7)

WATER WELL RECORD

INFORMATION ON WELL LOCATION

ounty in which well was drilled: Lake Civil Township: _____

ongressional township: _____ Range: _____ Number of section: _____

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets r distinctive landmarks: _____

= 49.31

Name of owner: Russell Banister Address: 1525 E. Elm St Griffith Ind.

ame of Well Drilling Contractor: John Farmer

Address: 2830-45th Highland, Indiana

ame of Drilling Equipment Operator: Paul Kikbert

INFORMATION ON THE WELL

Completed depth of well: 40 ft. Date well was completed: Nov. 5-1959

Diameter of outside casing or drive pipe: 2" Length: 21-ft

Diameter of inside casing or liner: _____ Length: _____

Diameter of Screen: 1" Length: 4 ft Slot size: 60

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☑ Other _____

Use of Well: For home ☑ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Driven ☐

Static water level in completed well (Distance from ground to water level) _____ ft.

Bailer Test: Hours tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 1.5 g.p.m. Drawdown 8 ft.

Signature John Farmer - G.F. Sec

Date Nov. 14-1959

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(Well Dr[illegible]er does not fill out)

NTY: Lake TWP. 36 N RGE. 9 W ___ ¼ ___ ¼ ___ ¼ SEC. 36

o. Map: Highland 2½ Loc. accepted w/o verification Yes ___ No ___

of grnd. surface at well: ___ Courthouse Loc. By ___ Date ___

th to bedrock: ___ Field Located By ___ Date ___

l Log processed by: ___ Placed in Master Well Log File Date ___

REMARKS:

INSTRUCTIONS

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An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation, 311 West Washington Street, Indianapolis, Indiana.

5.425
405330

(8)

WATER WELL RECORD
State Form 35680

Mail completed record within 30 days to:
DIVISION OF WATER
INDIANA DEPARTMENT OF NATURAL RESOURCES
605 STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
PHONE (317) 232-4160

Cheever Park

Griffith Cheever Park

WELL LOCATION
(Fill in completely)

County where drilled: Lake County

Civil Township: Ross Twp

Giving directions to the well location (include county road names, numbers, subdivisions, lot number with consideration to intersecting roads and trip origins (15n) There is space for a map on reverse side.

Location of Well

Co. Parks Dept. is:
225 N. Main St
Crown Point, In

OWNER — CONTRACTOR

Well owner: Lake County Parks & Recreation Dept.

Address: 301 S. Colfax St Griffith - Ind. 46319

Building contractor:

Address:

Drilling contractor: John Farmer & Sons Water Pump Serv. Inc.

Address: 9703 Kennedy Ave - Highland - Ind. 46322

Equipment operator: Donald R. Farmer

Completion date: Aug. 24-1983

CONSTRUCTION DETAILS

Type of well: ☑ Drilled ☐ Gravel pack ☐ Driven ☐ Other

Use of well: ☐ Home ☐ Industry ☐ Test ☐ Irrigation ☑ Public supply ☐ Stock ☐ Other (specify)

Method of drilling: ☐ Cable tool ☐ Rotary ☑ Jet ☐ Rev. rotary ☐ Bucket rig

Casing length: 54 ft. feet	Diameter: 2" inches
Screen length: 4 ft. feet	Diameter: 1 1/4" inches
Screen slot size: .006	

Depth of pump setting:

Type of pump: ☐ Submersible ☐ Shallow-well jet ☐ Deep-well jet ☑ Other (specify) Hand Pump

WELL CAPACITY TEST

(Check one) ☐ Bailing ☑ Pumping

Test rate: 12 gpm 1 hrs	Drawdown: 0 feet
Static level (depth to water): 3 feet	

Water quality (clear, cloudy, odor, etc.): Clear

WELL LOG

Formations: type of material	From	To
Black Dirt	0 ft.	10 ft.
Blue Clay	10	30
Fine Sand	30	38
Mean Coarse Sand	38	58

(Additional space for Well Log on reverse side)

Signed: Arlene J. Gagliardi Secy-Treas.

Date: 2/16/84

(8)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

County	Twp.	Rge.		Sec.
Lyon	35N	9W	NE ¼ NW ¼ NW	1

Topo map: Yellow Lake	Ft. W of EL	Ground elevation: 635	Subdivision name
Field located By: DTK Date: 7/31/86	Ft. N of SL	Depth to bedrock	Lot no.
Courthouse location By: Date	1000 Ft. E of WL	Bedrock elevation	
Location accepted w/o verification by: Park owner and address verified location.	700 Ft. S of NL	Aquifer elevation: 578	

WWRS INC

WELL LOG
(Continued from front side)

Formations: type of material	From	To
	ft	ft

SKETCH SHOWING LOCATION
Locate with reference to highways, intersecting county roads, and distinctive landmarks.

N

W E

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

WWRS

9

Water sample call - ted by Ron Weiss SBH

594805
464280

24

WATER WELL RECORD

24

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled: Lake Civil Township: Calumet

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner: Anton Jose Address: 1106 S. Broad

Building Contractor: — Address: Griffith Ind.

Name of Well Drilling Contractor: Herb Plumbing Co.

Address: Eric H. Heidelberg

Name of Drilling Equipment Operator:

WELL INFORMATION

Depth of well: 61 Date well was completed: 7/27/71

Diameter of casing or drive pipe: 2" Total Length: 56

Diameter of liner (if used): — Total Length:

Diameter of Screen: 1¼" plastic Length: 5 ft. Slot Size: .006

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 8 feet

Bailer Test: Hours Tested — Rate ___ g.p.m. ___ Drawdown ___ ft.

Pumping Test: Hours Tested ½ Rate 10 g.p.m. — Drawdown ___ ft.

(Drawdown is the difference between static level and water level at end of test)

Signature: Eric H. Heidelberg

Date: 2/13/72

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(9)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY _____ TWP. 35N RGE. 9W NE ¼ NW ¼ NW SEC 11 Subdivision Name _____

Topo Map _____

Field Located By Ron Weiss Date 15811 8/12/81

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL. Ground Elevation 630

_____ Ft N of SL. Depth to bedrock _____

1200 Ft E of WL. Bedrock elevation _____

650 Ft S of NL. Aquifer elevation 570 - Lot Number _____

(GW) STRATEGY PROJECT - ISBH

WWDS

WATER WELL LOG

To	From	FORMATIONS (Color, type of material, hardness, etc.)
25	0	Clay
55	25	dirty sand
62	55	sand

630
60
570

(10)

WWRS

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

Water sample collected by Ron Weiss

594660
465110

SBH (20)

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township St John Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner ~~Mr. Witkowski~~ Kirt Evans Address 1026- S. Aberger Street - Griffith, Ind.

Building Contractor _____ Address _____

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service Inc.

Address 9703 Kennedy Ave - Highland, Indiana

Name of Drilling Equipment Operator: Jerald A. Farmer

WELL INFORMATION

Depth of well: 51' Date well was completed: Feb. 26-1973

Diameter of casing or drive pipe: 2" Total Length: 46'

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 1/14" Length: 5 ft Slot Size: 006

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) _____ feet

Bailer Test: Hours Tested 2 Rate _____ g.p.m. 12 Drawdown 0 ft.

Pumping Test: Hours Tested 2 Rate _____ g.p.m. 10 Drawdown 0 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Adelma I. Gagliardi Secy-Treas

Date April 6-1973

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(10)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Yolo TWP. 35 N RGE. 9W ¼ SE ¼ NW ¼ NE SEC. 11 Subdivision Name

Topo Map [illegible]

Field Located By [illegible] Date 15B11 8/12/81

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

1450 Ft W of EL. Ground Elevation 630

_____ Ft N of SL. Depth to bedrock _____

_____ Ft E of WL. Bedrock elevation _____

1100 Ft S of NL. Aquifer elevation 580- Lot Number _____

GW STRATEGY PROJECT - ISBH

WWR

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To
Soil	0	2
Fine Sand	2	37
Blue Clay	37	46
Blue Sand	46	51

STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

(11)

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake - Civil Township St John Twp

Giving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Charles Sant Angelo Address 1710 S. Arbogast St. - Griffith

Building Contractor _____ Address _____

Name of Well Drilling Contractor: Jo Farmer & Sons Well & Pump Service Inc.

Address 9703 Kennedy Ave. - Highland, Indiana

Name of Drilling Equipment Operator: _____

WELL INFORMATION

Depth of well: 65 ft Date well was completed: Sept. 23-1971

Diameter of casing or drive pipe: 4" Total Length: 57

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 5" Length: 8 ft Slot Size: 06

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☑ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 15' feet

Bailer Test: Hours Tested 2 Rate 40 g.p.m. Drawdown _____ ft.

Pumping Test: Hours Tested 2 Rate 12 g.p.m. Drawdown _____ ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Carmen A. Ingrassia

Date Oct. 9-1971

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(11)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY _____ TWP. _____ RGE. 9 _____ ¼ _____ ¼ _____ SEC _____ Subdivision Name

Topo Map H[illegible] 72' _____ Ft W of EL. Ground Elevation _____

Field Located By _____ Date _____ Ft N of SL. Depth to bedrock _____

Courthouse Location By _____ Date _____ Ft E of WL. Bedrock elevation _____

Location accepted w/o verification by _____ Ft S of NL. Aquifer elevation _____ Lot Number _____

To	From	FORMATIONS (Color, type of material, hardness, etc.)
2	0	Soil
57	2	Clay
65	57	Sand

(12)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

WWRS

Water sample coll - Ted by Ron Weiss SBH

59450
463930

(26)

WATER WELL RECORD

(26)

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner John Price Address 1105 - S. Cline Ave. - Griffith - Ind.

Building Contractor _____ Address _____

Name of Well Drilling Contractor: J. Farmer & Sons Well + Pump Service Inc.

Address 9703 - Kennedy Ave - Highland, Indiana 46322

Name of Drilling Equipment Operator: Donald Farmer

WELL INFORMATION

Depth of well: 57 ft Date well was completed: Aug. 12-1971

Diameter of casing or drive pipe: 2" Total Length: 52 ft

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 1/14" Length: 5 ft Slot Size: .006

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☑ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 17 feet

Bailer Test: Hours Tested 2 Rate 15 g.p.m. _____ Drawdown None ft.

Pumping Test: Hours Tested 2 Rate 10 g.p.m. _____ Drawdown None ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Arlene S. Gagliardi

Date Sept. 11-1971

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(12)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY La Paz TWP. ~~36N~~ 35 N RGE. 9W NW ¼ NW ¼ NW ¼ SEC. 11 Subdivision Name

Topo Map

Field Located By Ron Weiss Date ISBH 8/12/81

Courthouse Location By Date

Location accepted w/o verification by

Ft W of EL. Ground Elevation 633

Ft N of SL. Depth to bedrock

100 Ft E of WL. Bedrock elevation

450 Ft S of NL. Aquifer elevation 575- Lot Number

GW STRATEGY PROJECT - ISBH

WWRS

WATER WELL LOG

To	From	FORMATIONS (Color, type of material, hardness, etc.)
1	0	Soil
17	1	Rusty Sand
49	17	Clay
57	49	Sand

633
57
576

— Watersample collected by Ron Weiss SBH

(25)

INDIANAPOLIS, INDIANA 46209
MElrose 3-6757

WATER WELL RECORD

594700
463941/5

(13)

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: St. John

Congressional township: 35N Range: 9W Number of section: 11

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks:

Name of owner: Frank Rozich Address: 1201 S. Clair

Name of Well Drilling Contractor:

Address:

Name of Drilling Equipment Operator: Eric V. Heistberg

INFORMATION ON THE WELL

Completed depth of well: 56 ft. Date well was completed: 8/13/69

Diameter of outside casing or drive pipe: 2" Length: 52

Diameter of inside casing or liner: — Length:

Diameter of Screen: 1¼" plastic Length: 4ft Slot size: .006

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other

Use of Well: For home ☒ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Driven ☐

Static water level in completed well (Distance from ground to water level) 10 ft.

Bailer Test: Hours tested — Rate — g.p.m. Drawdown — ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 10 g.p.m. Drawdown — ft.

Signature Eric V. Heistberg

Date 12/3/69

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

FOR ADMINISTRATIVE USE ONLY
(Well drilled does not fill out)

(13)

: Lake

o Map: Lyftbrow 7½

TWP. 35N RGE. 9W SW ¼ NW ¼ NW ¼ SEC. 11

l log classified By RK Date 1/20 Ft W of EL. Ground elevation 630
rthouse located By Date Ft N of SL. Depth to bedrock
ld located By Date 1/20/11 100 Ft E of WL. Bedrock elevation
. w/o verification By Date 1000 Ft S of NL. Aquifer elevation 510 -

GROUND-WATER STRATEGY PROJECT - 1990

dirty sand	0	51
sand	51	60

REMARKS:

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a water well. We request that you be as accurate as possible in recording this information as it may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water

(14)

575450
463950

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

WWRS

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet ~~Lake~~ Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER ~~and/or BUILDING~~ CONTRACTOR

Well Owner James Cooke Jr. Address 617 - S. Cline Ave - Griffith, Ind.

Building Contractor Address

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service Inc.

Address 9703 Kennedy Ave - Highland, Indiana 46322

Name of Drilling Equipment Operator: Jerald A. Farmer

WELL INFORMATION

Depth of well: 61 ft Date well was completed: March 3-1973

Diameter of casing or drive pipe: 2" Total Length: 56'

Diameter of liner (if used): Total Length:

Diameter of Screen: 1 1/4" Length: 5 ft Slot Size: .006

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) feet

Bailer Test: Hours Tested 2 Rate g.p.m. 12 Drawdown 0 ft.

Pumping Test: Hours Tested 2 Rate g.p.m. 10 Drawdown 0 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Adelma I. Gigliardi - Secy-Treas.

Date April 6-1973

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(14)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 35N RGE. 9W SW ¼ NW ¼ SW ¼ SEC 2 Subdivision Name

Topo Map Highland

Field Located By DTK Date 7/31/86

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

1500 Ft N of SL.

100 Ft E of WL.

_____ Ft S of NL.

Ground Elevation ~~63~~ 631

Depth to bedrock _____

Bedrock elevation _____

Aquifer elevation 569

Lot Number _____

WWRC

Neighbor verified address location.

WATER WELL LOG

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	2	Soil
2	26	Medium Sand
26	44	Clay Gray
44	54	Fine Sand
54	61	Clay & Sand

(15) (16)

545225
463750

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

WWRS

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake County Civil Township Ross Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

Chmielewski

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Andrew Chmielewski Address 1699 S. Cline Ave. - Griffith, Ind

Building Contractor Address

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service

Address 9703 - Kennedy Ave. Highland, Indiana

Name of Drilling Equipment Operator: Donald Farmer

WELL INFORMATION

Depth of well: 52' Date well was completed: June 12-1973

Diameter of casing or drive pipe: 3" Total Length: 47'

Diameter of liner (if used): Total Length:

Diameter of Screen: 1 1/2" Length: 5 ft Slot Size: .006

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other

Use of Well: For Home ☑ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) feet

Bailer Test: Hours Tested 2 Rate 14 g.p.m. Drawdown 0 ft.

Pumping Test: Hours Tested 2 Rate 12 g.p.m. Drawdown 0 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Adelma I. Gigliardi

Date July 19-1973

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(5)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 35N RGE. 9W NW ¼ SW ¼ SW SEC 2 Subdivision Name

Topo Map Highland 7½'

Field Located By DJK Date 7/31/86

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

Ft W of EL. _____ Ft N of SL. 750 Ft E of WL. 100 Ft S of NL. _____

Ground Elevation 630

Depth to bedrock _____

Bedrock elevation _____

Aquifer elevation 578 Log Number _____

Original verified from source / address location.

WWRS

WATER WELL LOG

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	2	Soil
2	17	Sufice Sand
17	33	Clay
33	47	Fine Sand
47	52	Clean Coarse Sand

575 150
403360

(17)

WATER WELL RECORD
State Form 35680

Mail completed record within 30 days to:
DIVISION OF WATER
INDIANA DEPARTMENT OF NATURAL RESOURCES
605 STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
PHONE (317) 232-4160

DEC 1984 RECEIVED DEPT. OF NATURAL RESOURCES DIVISION OF WATER

WELL LOCATION (Fill in completely)

County where drilled: Lake County

Civil Township: St. John Twp

Driving directions to the well location (Include county road names, numbers, subdivisions, lot number with consideration to intersecting roads and trip odometer tion) There is space for a map on reverse side.

OWNER — CONTRACTOR

Well owner: Mr. J. Sparks

Address: 1964 So. Cline Ave. - Griffith - Ind. 46319

Building contractor:

Address:

Drilling contractor: John Farmer & Sons Well & Pump Serv. Inc

Address: 9703 Kennedy Ave. - Highland - Ind. 46322

Equipment operator: Everett H. Farmer

Completion date: Aug. 7-1984

CONSTRUCTION DETAILS

Type of well: ☑ Drilled ☐ Gravel pack ☐ Driven ☐ Other

Use of well: ☑ Home ☐ Industry ☐ Test ☐ Irrigation ☐ Public supply ☐ Stock ☐ Other (specify)

Method of drilling: ☐ Cable tool ☑ Rotary ☐ Jet ☐ Rev. rotary ☐ Bucket rig

Casing length: 55 ft. feet	Diameter: 4" inches
Screen length: 8 feet	Diameter: 4" inches
Screen slot size: .006	

Depth of pump setting:

Type of pump: ☑ Submersible ☐ Shallow-well jet ☐ Deep-well jet ☐ Other (specify)

WELL LOG

Formations: type of material	From	To
Dirty Sand	0 ft.	17 ft.
Clay	17	29
Fine Sand	29	48
Clear Sand	48	63

(Additional space for Well Log on reverse side)

WELL CAPACITY TEST

(Check one) ☐ Bailing ☑ Pumping

Test rate: 15 gpm 1½ hrs | Drawdown: 9 feet

Static level (depth to water): 21 ft. feet

Water quality (clear, cloudy, odor, etc.): Clear

Signed: Carlene A. Gaglierdi Secy - Treas. | Date: Dec. 20-1984

5

Location accepted w/o verification by
Mailing verified location.

Ft. E of WL

Ft. S of NL

Bedrock elevation

Aquifer elevation 567

WWKS
mc

WELL LOG
(Continued from front side)

Formations: type of material	From	To
	ft	ft

SKETCH SHOWING LOCATION
Locate with reference to highways, intersecting county roads, and distinctive landmarks.

N

W

E

S

593725
403040

18

WATER WELL RECORD
State Form 35680

Mail completed record within 30 days to:
DIVISION OF WATER
INDIANA DEPARTMENT OF NATURAL RESOURCES
605 STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
PHONE (317) 232-4160

WELL LOCATION
(Fill in completely)

County where drilled: LAKE COUNTY

Civil Township: ST. JOHN TOWNSHIP

Driving directions to the well location (include county road names, numbers, subdivisions, lot number with consideration to intersecting roads and trip origination) There is space for a map on reverse side.

U.S. 30 TO AUSTIN AVE. N. ON AUSTIN TO GOLFVIEW DR. EAST ON GOLFVIEW DR. TO 331 GOLFVIEW

OWNER — CONTRACTOR

Well owner: DAVID + PATRICIA CHORBA

Address: 331 GOLFVIEW DR. SCHERERVILLE, IN. 46375

Building contractor:

Address:

Drilling contractor: THOMAS J. SHANLEY (#463)

Address: 626 SANDI LANE SCHER. IN. 46375

Equipment operator: THOMAS J. SHANLEY

Completion date: 5-11-85

CONSTRUCTION DETAILS

Type of well: ☒ Drilled ☐ Gravel pack ☐ Driven ☐ Other

Use of well: ☐ Home ☐ Industry ☐ Test ☒ Irrigation ☐ Public supply ☐ Stock ☐ Other (specify)

Method of drilling: ☐ Cable tool ☒ Rotary ☐ Jet ☐ Rev.-rotary ☐ Bucket rig

Casing length: 28 feet — Diameter: (PVC) 2 inches

Screen length: 5 feet — Diameter: (NYLON) 1½ inches

Screen slot size: .006

Depth of pump setting: ABOVE GROUND (IN GARAGE)

Type of pump: ☐ Submersible ☐ Shallow-well jet ☐ Deep-well jet ☒ Other (specify) F+W C6267

WELL CAPACITY TEST

(Check one) ☐ Bailing ☒ Pumping

Test rate: (APPROX) 20 gpm ____ hrs — Drawdown: ____ feet

Static level (depth to water): (APPROX.) 15 feet

Water quality (clear, cloudy, odor, etc.): CLEAR

WELL LOG

Formations: type of material	From	To
FINE SAND	0 ft.	11 ft.
CLAY	11 ft.	18 ft.
COARSE SAND	18 ft.	33 ft.

(Additional space for Well Log on reverse side)

Signed: Thomas J. Shanley (#463) — Date: 5-12-85

(18)

(Well driller does not fill ot)

County	Twp.	Rge.		Sec.
Lake	35N	9W	NE ¼ SE ¼	10

Topo map: Libertyville	Ft. W of EL	Ground elevation	Subdivision name
Field located By Date	Ft. N of SL	Depth to bedrock	Lot no.
Courthouse location By Date	Ft. E of WL	Bedrock elevation	
Location accepted w/o verification by	Ft. S of NL	Aquifer elevation 602'	

WWRS

WELL LOG
(Continued from front side)

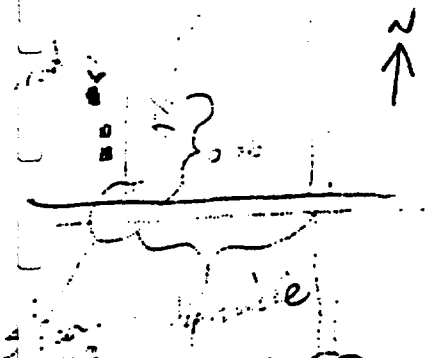
Formations: type of material	From	To
	ft	ft

SKETCH SHOWING LOCATION
Locate with reference to highways, intersecting county roads, and distinctive landmarks.

N

W E

S



C|F

35/9W - 3R1

(19)

DIVISION OF WATER RESOURCES
INDIANA DEPARTMENT OF CONSERVATION
311 WEST WASHINGTON STREET
INDIANAPOLIS, INDIANA

DWRS

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: LAKE Civil Township: Calumet

Congressional township: 35N Range: 9W Number of section: 3

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: 3rd House north of 116 th on McKinley Ave Griffith, Indiana House on West Side of street.

Name of owner: Guy Cordy Address:

Name of Well Drilling Contractor: Comer Drilling Co.

Address: 170 th & Cal. Expy. South Holland Ill.

Name of Drilling Equipment Operator: Homer E. Glenn

INFORMATION ON THE WELL

Completed depth of well: 131 ft. Date well was completed: 12-9-60

Diameter of outside casing or drive pipe: 4" OD 4" ID Length: 123'

Diameter of inside casing or liner: — Length: —

Diameter of Screen: — Length: — Slot size: —

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other

Use of Well: For home ☒ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☒ Rotary ☐ Rev. Rotary ☐ Jet ☐ Driven ☐

Static water level in completed well (Distance from ground to water level) 6 ft.

Bailer Test: Hours tested 3 Rate 20 g.p.m. Drawdown None ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested ____ Rate ____ g.p.m. Drawdown ____ ft.

not home

Signature J. R. Stinnett

Date 2-13-60

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(19)

WATER WELL LOG

FOR ADMINISTRATIVE USE ONLY
(Well Driller does not fill out)

COUNTY: Lake TWP. ~~36N~~ 35 RGE. 9W SE ¼ SE ¼ SE ¼ SEC. 3

Topo. Map: Highland Loc. accepted w/o verification Yes ___ No ___

El. of grnd. surface at well: 628 Courthouse Loc. By ___ Date ___

Depth to bedrock: ___ Field Located By Date 11-29-

Well Log processed by: ___ Placed in Master Well Log File Date ___

590' NSL

ORMATIONS (Color, type of material, hardness, etc.)	From	To
Sand Yellow	0	20
CLAY	20	50
GRAVEL	50	60
Sand	60	74
CLAY	74	89
GRAVEL	89	94
Hard Sand GRAY	94	115
CLAY	115	123
LIMESTONE	123	131

400 WEL

UTM Approx 595 170

463875

EMARKS: Drilled through the limestone 131' into sand. Lots of Water

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a ter well. We request that you be as accurate as possible in recording this information as may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. ease include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted thin thirty days after the completion of a well to the Division of Water Resources, Indiana partment of Conservation, 311 West Washington Street, Indianapolis, Indiana.

Telephone 633-5267 Area Code 317

(20)

WATER WELL RECORD

LL LOCATION (Fill in completely - Refer to instruction sheet)

nty in which well was drilled Lake Civil Township Calumet

riving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

ME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner _____ Address _____

uilding Contractor _____ Address _____

me of Well Drilling Contractor: _____

dress _____

ne of Drilling Equipment Operator: _____

LL INFORMATION

epth of well: 85' Date well was completed: 12-9-44

meter of casing or drive pipe: 38" Total Length: _____

Diameter of liner (if used): _____ Total Length: _____

meter of Screen: 12" Length: 20 Slot Size: _____

pe of Well: Drilled ☐ Gravel Pack ☐ Driven ☐ Other _____

se of Well: For Home ☐ For Industry ☐ For Public Supply ☐ Stock ☐

thod of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 15' feet

ler Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft.

mping Test: Hours Tested 1 Rate 320 g.p.m. Drawdown 30 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature _____

Date _____

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

(28)

COUNTY Lake TWP. 36N RGE. 9W ¼ NE ¼ SW SEC. 35 Subdivision Name

Topo Map Highland

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

_____ Ft S of NL.

Ground Elevation 630 Lagoe - Northern

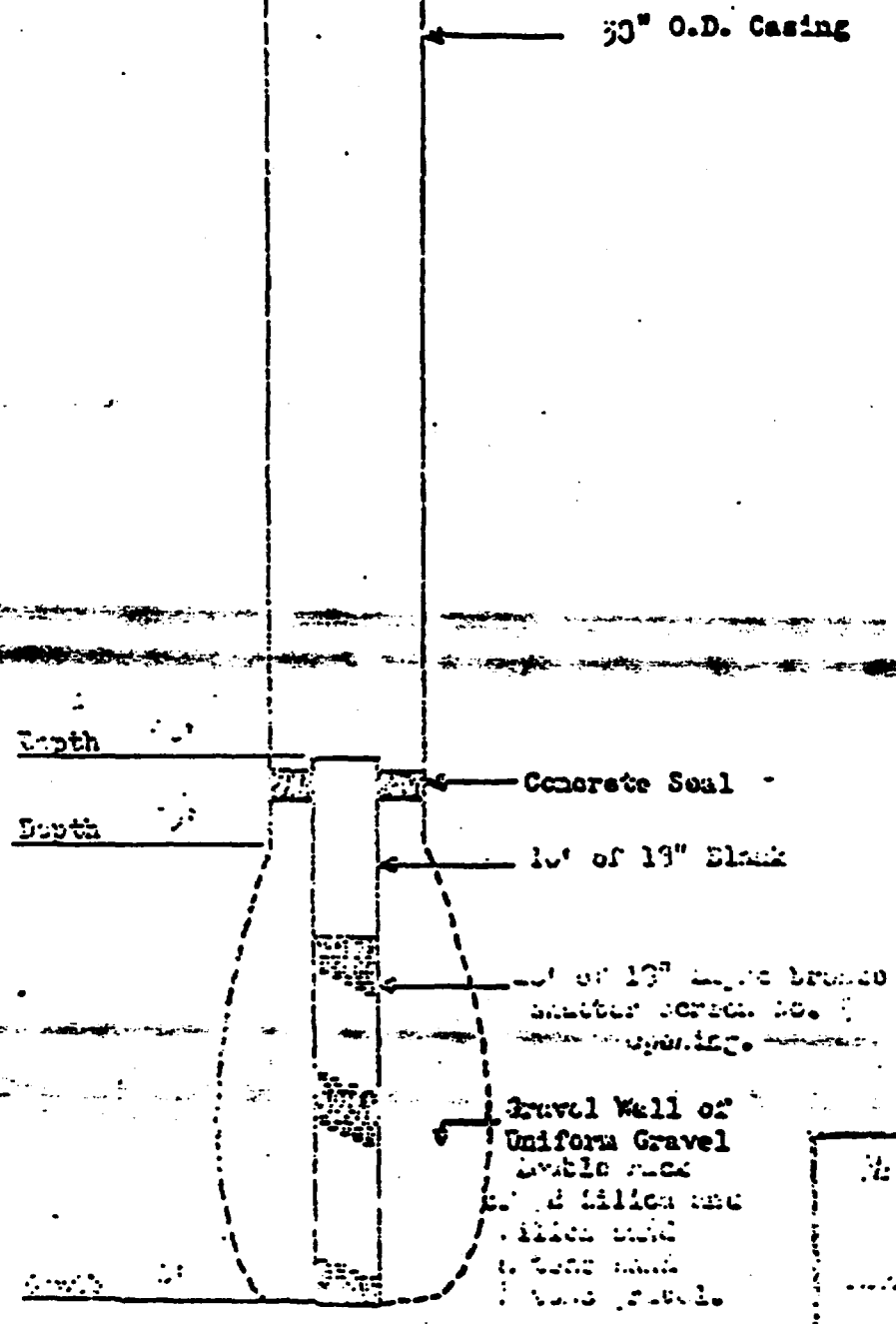
Depth to bedrock 11-9-44

Bedrock elevation _____

Aquifer elevation 545 Lot Number _____

To	From	Formations (color, type of material, hardness, etc.)
17	0	Sand
36	17	Medium clay
40	36	Muddy sand
55	40	Hard clay
62	55	Fine sand
65	62	Medium sand
85	65	Fine sand

AW (30)



36N 9W SWSW

35

LAKE GRAVEL WELL WELL
Single Cased
For

Spec 9

(21)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake Co. TWP. 36N RGE. 9W ___ ¼ SW ¼ SW SEC 35 Subdivision Name

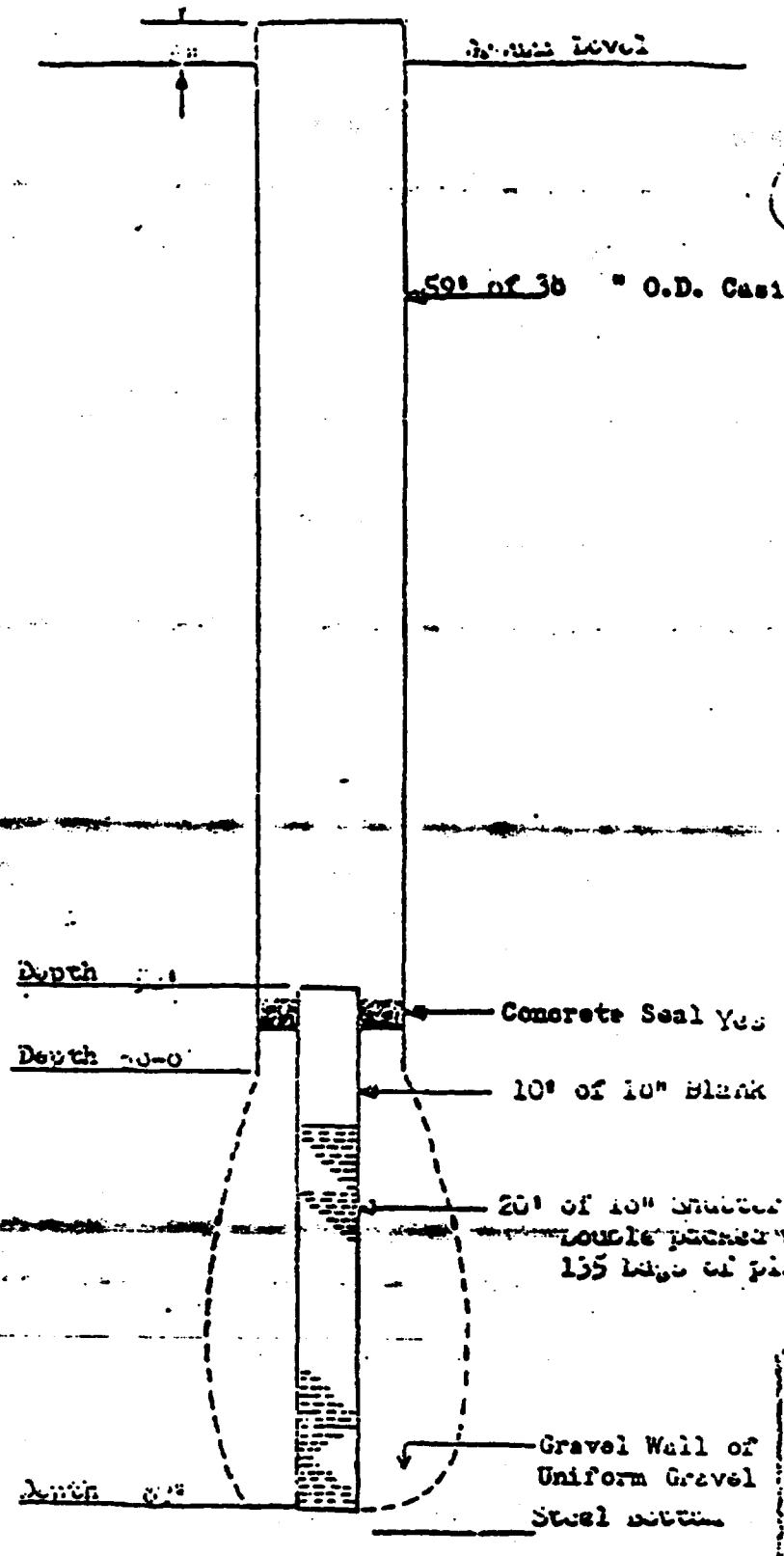
Topo Map Highland ___ Ft W of EL. Ground Elevation 630 Lyne - Northern

Field Located By ___ Date ___ ___ Ft N of SL. Depth to bedrock ___ 8-7-46

Courthouse Location By ___ Date ___ ___ Ft E of WL. Bedrock elevation ___

Location accepted w/o verification by ___ ___ Ft S of NL. Aquifer elevation ___ Lot Number ___

0	2	18	34	36	39	41	42	50	82																				
2	18	34	36	39	41	42	50	82																					
Top soil	Brown sand	Clay and gravel	Fine sand	Clay	Sand	Clay	Clay and gravel	Sand																					



22

Lake County
Calumet Twp.
Section 4 sec 31

3 SN 7 W

Single Cased
LAYNE GRAVEL WALL WELL No. ___
For
Calumet Park District
Chicago, Ill.

Drilled _____

Date Completed _____

Sp 10

LAYNE NORTHERN CO.

Static Level _____

Pumping Level _____

22

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 36N RGE. 9W SW ¼ SW ¼ SW SEC 35 Subdivision Name

Topo Map Highland _____ Ft W of EL. Ground Elevation 630 Layne Northern

Field Located By _____ Date _____ _____ Ft N of SL. Depth to bedrock _____ 3-3-59

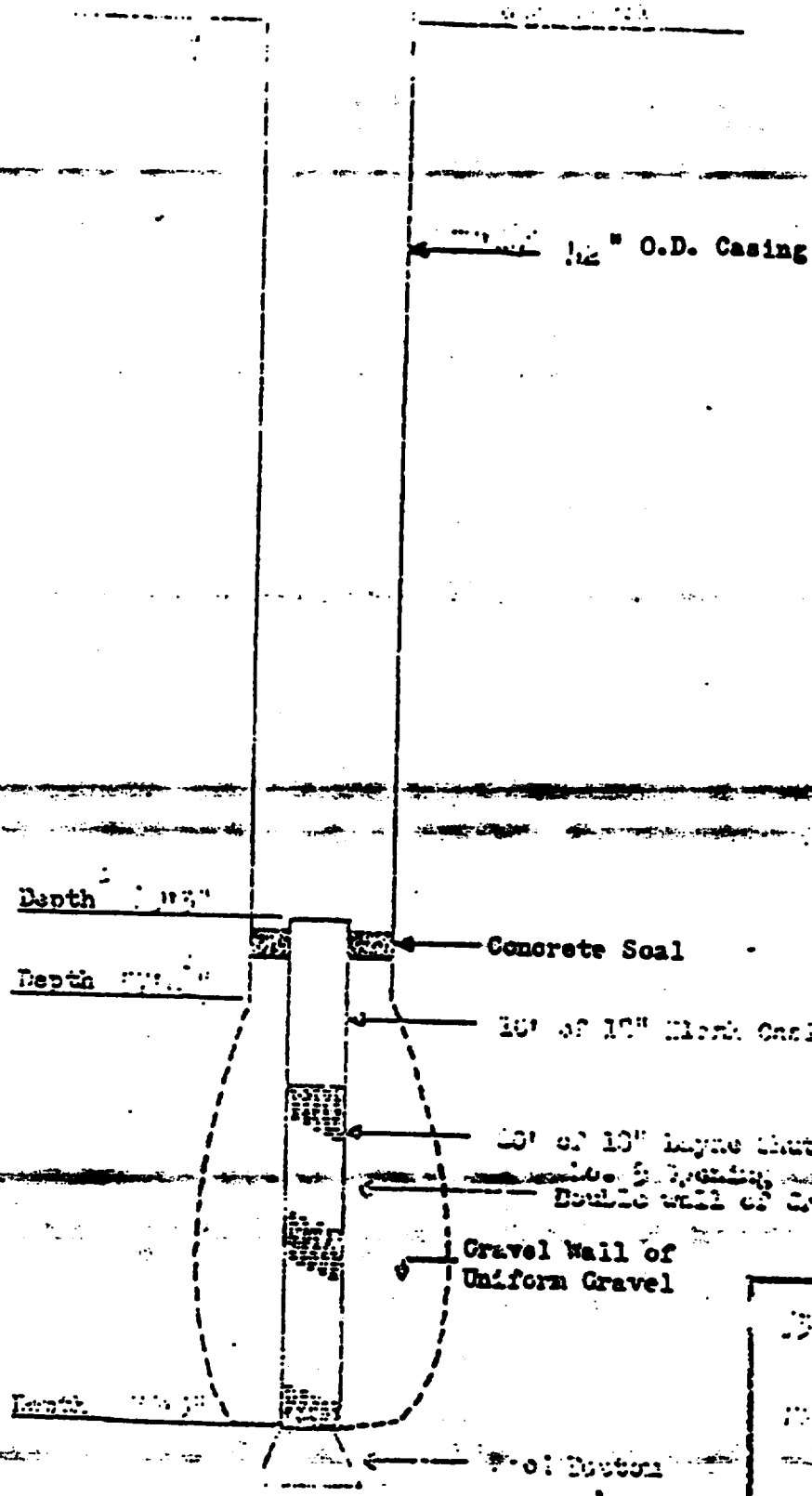
Courthouse Location By _____ Date _____ _____ Ft E of WL. Bedrock elevation _____

Location accepted w/o verification by _____ _____ Ft S of NL. Aquifer elevation _____ Lot Number _____

To																												
From																												

FORMATIONS (Color, type of material, hardness, etc.)

23



Lake Co.
Calumet Twp

36N 9W

LAINE GRAVEL WALL WELL
Single Cased
For

Driller
Date Finished

Sp 11

Static Level
Pumped GPM
at Pumping Level

LAINE NORTHERN CO. INC.
MISHAWAKA, INDIANA

DRAWN BY
APPROVED BY
DATE
DRAWING NO

(83)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 36N RGE. 9W ¼ SW ¼ SW SEC 35 Subdivision Name

Topo Map Highland _____ Ft W of EL. Ground Elevation 630 Layne - Northern

Field Located By _____ Date _____ _____ Ft N of SL. Depth to bedrock _____ 5-1-43

Courthouse Location By _____ Date _____ _____ Ft E of WL. Bedrock elevation _____

Location accepted w/o verification by _____ _____ Ft S of NL. Aquifer elevation _____ Lot Number _____

To	
From	
FORMATIONS (Color, type of material, hardness, etc.)	

Ground Level

Location

Lake Co.
Calumet Twp.
Section @ 35

S 35
3 N 9 W Ex 2 NE

24

35" or 34" = O.D. Casing

Depth 23'

Depth 54'

Concrete Seal Yes

20' of 18" Blank pipe

20 ft. of Louver

LAYNE Bronze Screen 18" Dia.

Opening .08

Silica Gravel Wall

yds.

Depth

Single Cased
LAYNE GRAVEL WALL WELL No. 7
For

Driller

Date Finished

Sp 13

LAYNE NORTHERN CO. INC
MICHIGAN INDIANA

Not drawn to Scale

Static Level

Pumping Level

DRAWN BY

APPROVED BY

DATE

(24)

R ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

?

OUNTY Lake TWP. 36N RGE. 9W SW ¼ SW ¼ SW ¼ SEC 35 Subdivision Name

opo Map Highland _____ Ft W of EL. Ground Elevation 630 Cayce - Northern

ield Located By _____ Date _____ _____ Ft N of SL. Depth to bedrock _____ 11-10-59

ourthouse Location By _____ Date _____ _____ Ft E of WL. Bedrock elevation _____

ocation accepted w/o verification by _____ _____ Ft S of NL. Aquifer elevation _____ Lot Number _____

NE

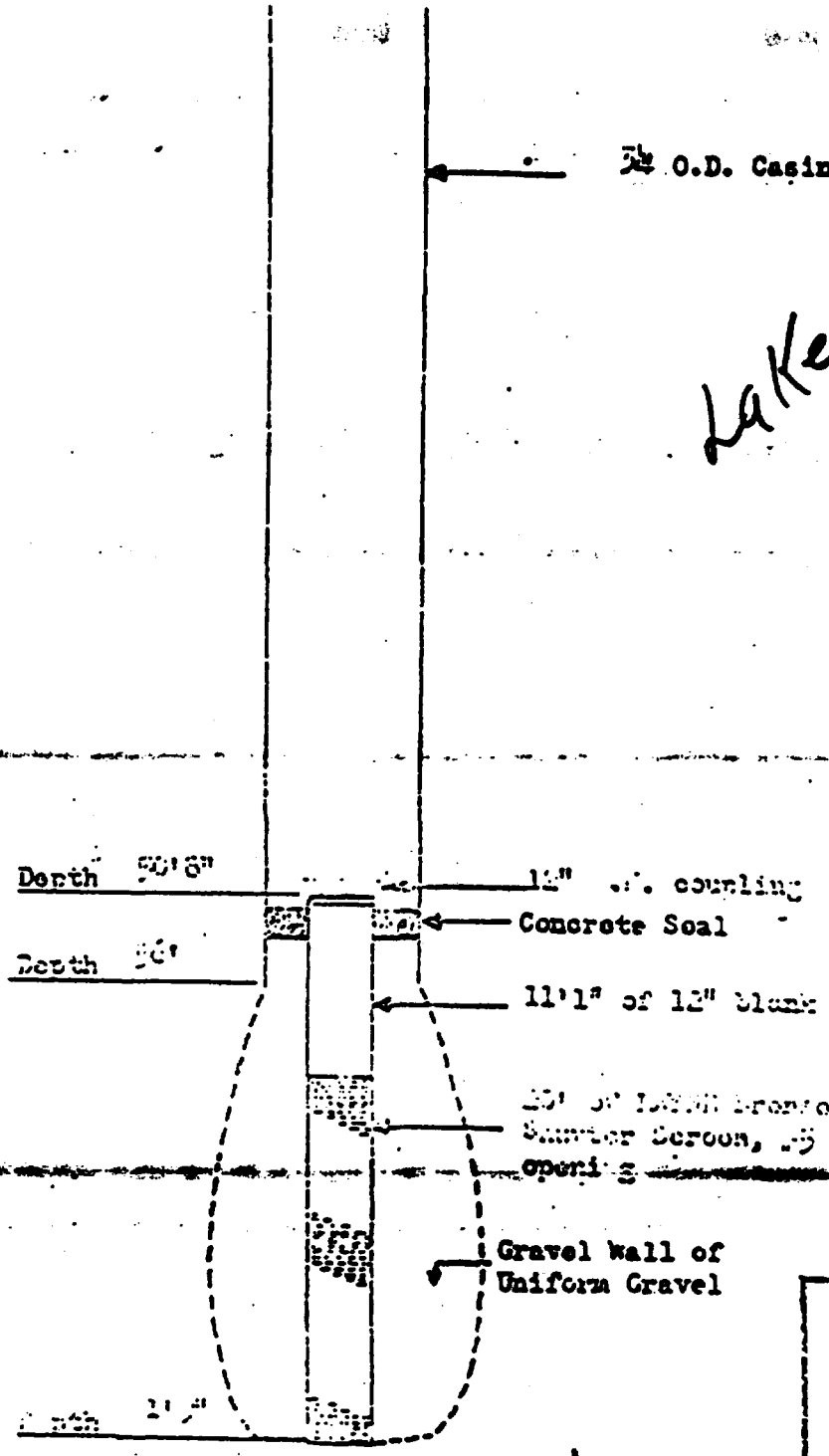
USGS #4

Lake County

(25)

WWRS

Lake 4



Lake Co

LAYNE GRAVEL WALL WELL
Single Cased
For

Driller
Date Finished

Static Level

Pumped GPM
at Pumping Level

Scale

LAYNE NORTHERN CO. INC.
MICHIGAN INDIANA

DRAWN BY
APPROVED BY

35-9w-2-J1

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

Lake 7

COUNTY: Lake TWP. 35N RGE. 9W ¼ NW ¼ SE ¼ SEC. 2

USGS WRD

Topo Map: Highland 7½

Well log located By HH Date 3-67
Courthouse located By ____ Date ____
Field located By ____ Date ____
Acc. w/o verification By ____ Date ____

____ Ft W of EL.
____ Ft N of SL.
____ Ft E of WL.
____ Ft S of NL.

Ground elevation 638
Depth to bedrock ____
Bedrock elevation ____
Aquifer elevation ____

Record 7-27-1956 TS

High 11.95 on 4-18-1960
Low 19.40 on 10-3-1962

From	To	FORMATIONS (Color, type of material, hardness, etc.)
		Lake 4 effected by county Ditch
		1 mi from Bull 18 p 92
0	8	Soil, sandy, gray
8	14	Sand, medium and gravel
14	38	Clay, hard
38	41	Sand, fine to medium
41	46	Sand, coarse, gravel
46	82	Sand, coarse, and gravel
82		Clay at

REMARKS: Bull 10 p 26-92-218

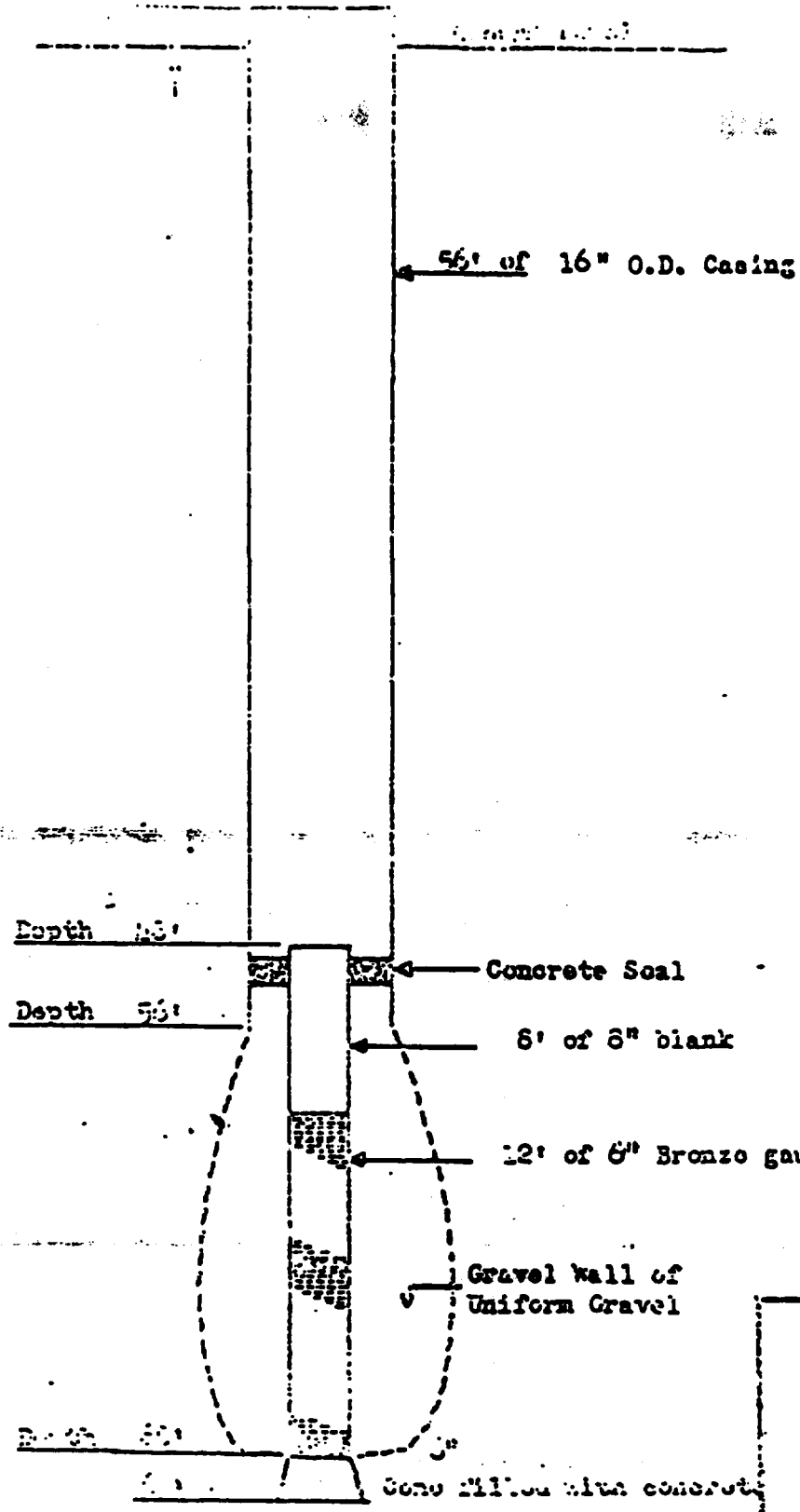
INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a water well. We request that you be as accurate as possible in recording this information. It may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water

26



Sample Co.
Site, John Sharp,
35 N 9 W sec 36 NE St

3#1

#1 GRAVEL WALL WELL
Single Cased
For
INDIANA PIPE LINE COMPANY
GRAPTON, INDIANA

5
5P

(26)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 35N RGE. 9W ¼ SE ¼ NE SEC. (33)

Subdivision Name

Topo Map Highland

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

_____ Ft S of NL.

Ground Elevation 630

Depth to bedrock _____

Bedrock elevation _____

Aquifer elevation 561

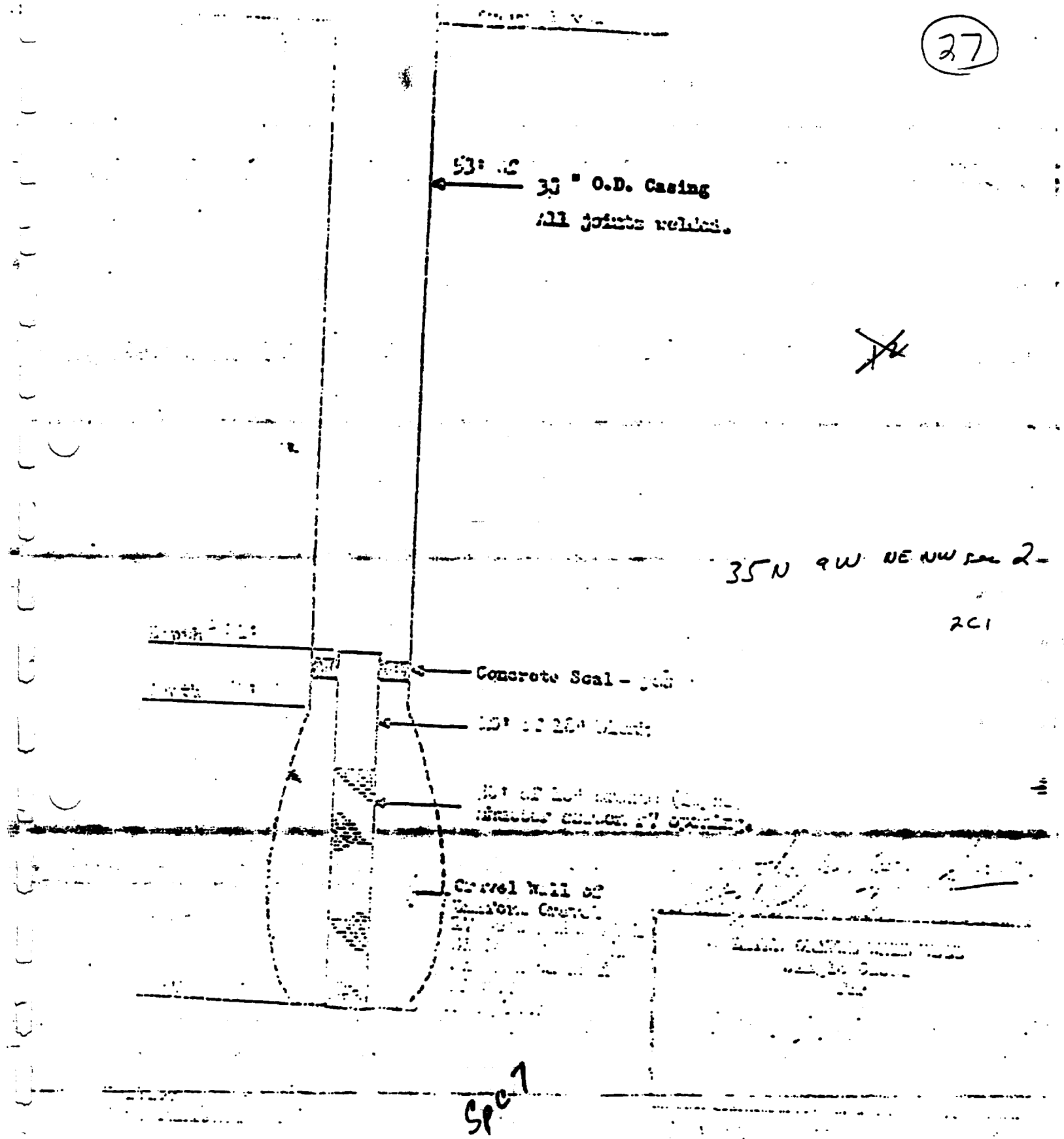
Layne - Northern

1-13-43

Lot Number _____

To	From	Type of material, color, hardness, etc.)
17	0	Fine sand
21	17	Clay
43	21	Gr. sand
47	42	Fine sand
69	47	Med. sand

27



35N 9W NE NW sec 2-

2C1

Spec 1

(87)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 35 N RGE. 9 W ¼ NE ¼ NW SEC 2 Subdivision Name

Topo Map Highland Ft W of EL. Ground Elevation 635 Layne Northern

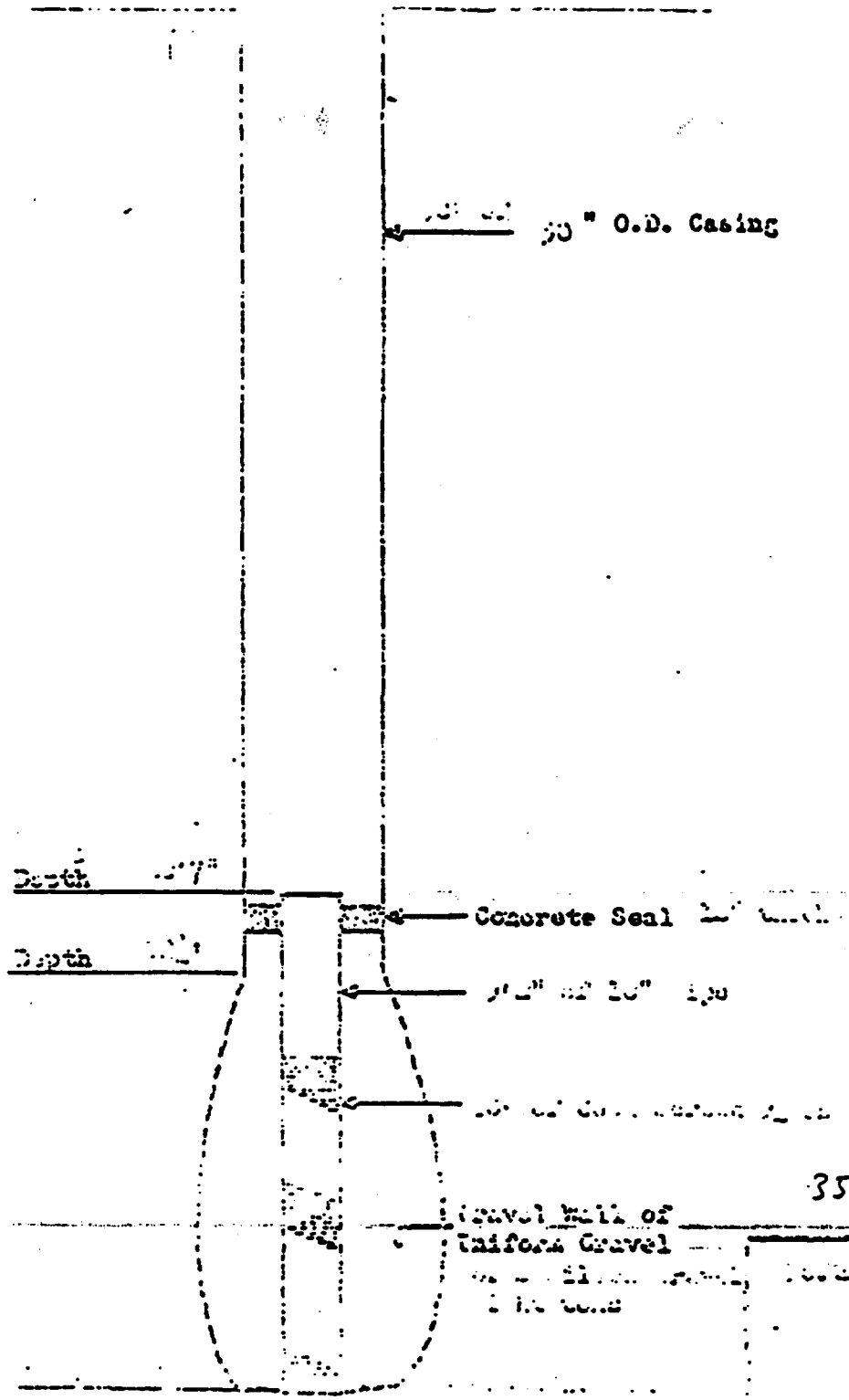
Field Located By Date Ft N of SL. Depth to bedrock 2-5-54

Courthouse Location By Date Ft E of WL. Bedrock elevation

Location accepted w/o verification by Ft S of NL. Aquifer elevation Lot Number

To	From	FORMATIONS (Color, type of material, hardness, etc.)
6	0	Sand brown
21	6	Sand gray
36	21	Clay blue
40	36	Sand and some gravel
50	40	Sand and clay, stripe
55	50	Sand fine gray
80	55	Sand medium
86	80	Sand fine

28



35N 9W sec 3 NE

SC 15

(28)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake Co. TWP. 35 N RGE. 9W ¼ SE ¼ NE SEC 3 Subdivision Name

Topo Map _____ Ft W of EL. _____ Ground Elevation 630 Lake Northern

Field Located By _____ Date _____ Ft N of SL. _____ Depth to bedrock _____ 5-22-45

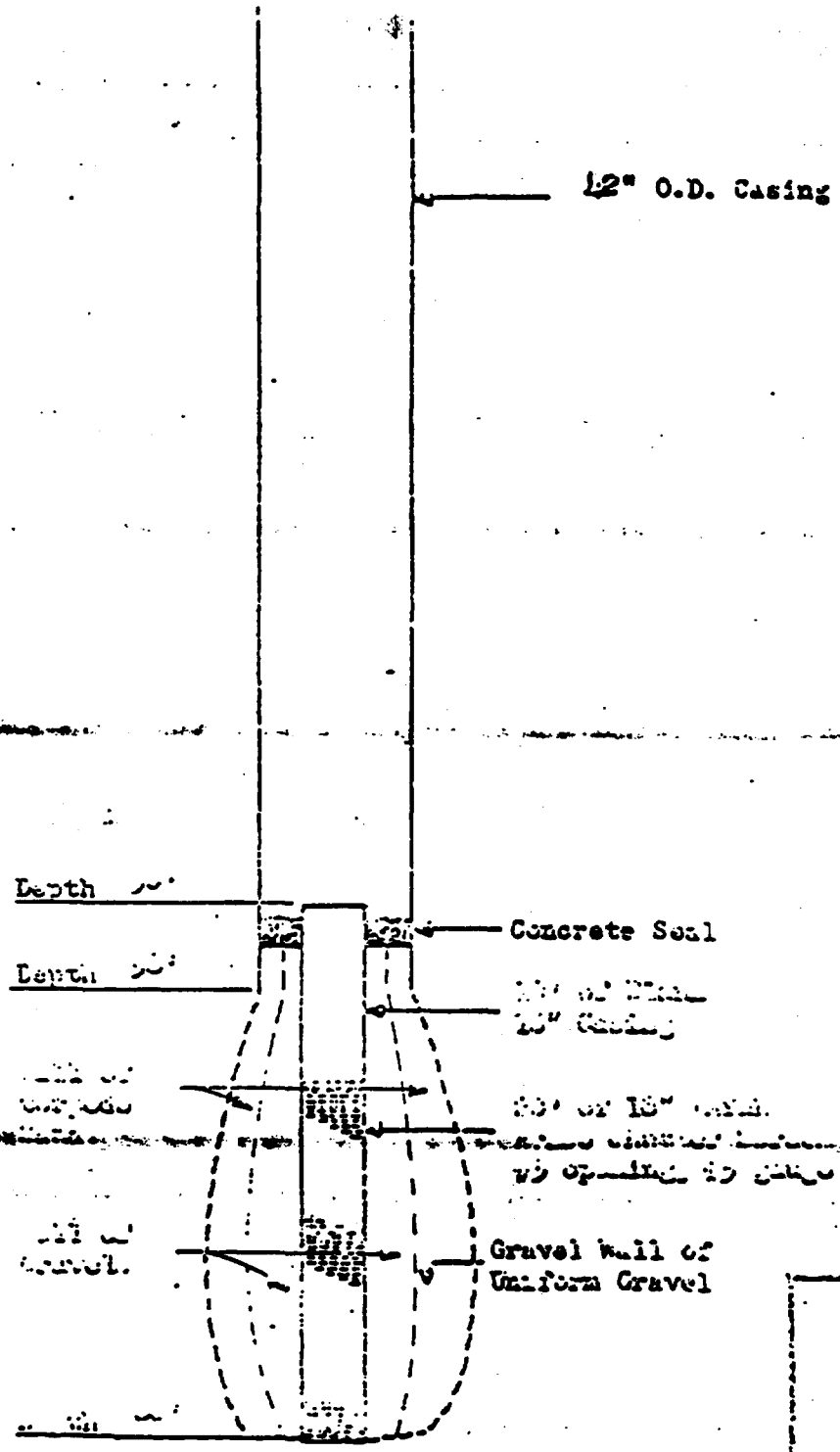
Courthouse Location By _____ Date _____ Ft E of WL. _____ Bedrock elevation _____

Location accepted w/o verification by _____ Ft S of NL. _____ Aquifer elevation _____ Lot Number _____

0	17	21	43	Fine sand
17	21	43	40	Clay
				Coc sand
				Fine sand

WWRS

29



36N 9W SWSWSec 3

LAYNE GRAVEL WALL WELL
Single Cased
Pat.

Sec 21

(8)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 36N RGE. 9W ¼ SW ¼ SW SEC 35 Subdivision Name

Topo Map Highland

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

_____ Ft S of NL.

Ground Elevation 630

Depth to bedrock _____

Bedrock elevation _____

Aquifer elevation _____

Lot Number _____

WWDS
Lake Division
6-2-39

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	17	Fine sand
17	31	Clay
31	32	Gravel and clay
32	35	Clay
35	40	Gravelly clay
40	60	Medium sand
60		Fine sand

In Coarse WQ point out

INDIANAPOLIS, INDIANA 46204

Telephone 317-232-4160

WWRS

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctiv landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Chesapeake and Ohio Railroad Company Address

Building Contractor Address

Name of Well Drilling Contractor: C. H. Miller

Address

Name of Drilling Equipment Operator:

WELL INFORMATION

Depth of well: 148 Date well was completed: 12-7-51

Diameter of casing or drive pipe: 4 Total Length:

Diameter of liner (if used): Total Length:

Diameter of Screen: Length: Slot Size: open

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other

Use of Well: For Home ☐ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) feet

Bailer Test: Hours Tested Rate g.p.m. Drawdown ft. (Drawdown is the difference between static level and water level at end of test)

Pumping Test: Hours Tested Rate g.p.m. Drawdown ft.

yield 21 gpm

Signature Lowell Wolfe, Sept 1984, [illegible]

Date USGS Bulletin 10 and WWRS

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

WWRS

COUNTY Lake TWP. 35N RGE. 9W ¼ SE ¼ NW SEC. 2 Subdivision Name

(30) Topo Map Highland

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

_____ Ft S of NL.

Ground Elevation 640

Depth to bedrock 131

Bedrock elevation 509

Aquifer elevation _____

Lot Number _____

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	119	fine sand
119	127	blue clay
127	131	fine sand
		Middle Silurian series
131	135	dolomite and dolomitic limestone with chert
135	145	limestone and dolomite

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46299
MElrose 3-6757

(31)

35-9w-2-J-1

WATER WELL RECORD

Lake 4

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township:

Congressional township: 35 N Range: 9 W Number of section: 2

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: Griffith Ches & Ohio RR

Name of owner: Ches & Ohio R R Address: Griffith

Name of Well Drilling Contractor: Logse Water Co.

Address:

Name of Drilling Equipment Operator:

INFORMATION ON THE WELL

Completed depth of well: 82 ft. Date well was completed: 12-5-1939

Diameter of outside casing or drive pipe: 34 Length: -

Diameter of inside casing or liner: 12 Length: 51 ft

Diameter of Screen: 12 in Length: 20 ft Slot size:

Type of Well: Drilled ☒ Gravel Pack ☒ Driven ☐ Other

Use of Well: For home ☐ For industry ☒ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☐ Driven ☐

Static water level in completed well (Distance from ground to water level) 18.01 ft. 7-27-1956

Bailer Test: Hours tested Rate g.p.m. Drawdown ft. (Difference between static level and water level at end of test.

Pumping Test: Hours tested Rate 330 g.p.m. Drawdown 23 ft.

Signature Bull 10; and dd card cite

Date D. Uffer no other citations

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET 2-12-67

Well Bor.

35-6W-2-J1

(31)

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To
~~Lake 4 affected by nearby pumping and strains~~		
~~Log from Bull 18 p 92~~		
Soil, sandy, gray	0	8
Sand, medium and gravel	8	14
Clay, hard	14	38
Sand, fine to medium	38	41
Sand, coarse, gravel	41	46
Sand, coarse, and gravel	46	82
Clay at	82	

Lake 4

COUNTY: Lake TWP. 35N RGE. 6W ¼ NW ¼ SE ¼ SEC. 2

Topo Map: Highland 7½

Well log completed By WLL Date 3-62

Courthouse located By ____ Date ____

Field located By ____ Date ____

Acc. w/o verification By ____ Date ____

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

Ft W of EL. ____ Ft N of SL. ____ Ft E of WL. ____ Ft S of NL. ____

Ground elevation 638 Depth to bedrock ____ Bedrock elevation ____ Aquifer elevation ____

Record 2-27-1956 to Right 11.95 on 4-18-1960 for 19.40 on 10-31-1962

REMARKS: Bull 10 p26-92-218

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a water well. We request that you be as accurate as possible in recording this information as it may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water

(32)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

Water sample collected by Ron Weiss

BH (17)

595775
465220

WWRS

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner American Chemical Address Gerhart St. Griffith, Ind.

Building Contractor _____ Address _____

Name of Well Drilling Contractor: John Farmer & Sons Well & Pump Service Inc

Address 9703 Kennedy Ave - Highland - Indiana 46322

Name of Drilling Equipment Operator: Jarold Farmer

WELL INFORMATION

Depth of well: 74 ft Date well was completed: Sept. 14-1971

Diameter of casing or drive pipe: 2" Total Length: 69 ft

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 1 1/4" Length: 5 ft Slot Size: .006

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☑ For Industry ☑ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) II. feet

Bailer Test: Hours Tested I Rate 15 g.p.m. _____ Drawdown None ft.

Pumping Test: Hours Tested I Rate 15 g.p.m. _____ Drawdown None ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Carlemo D. Gaglardi Sec

Date Oct. 9-1971

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(32)

American Chem

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY _____ TWP. 35N RGE. 9W NW ¼ NE ¼ SE SEC 2 Subdivision Name _____

Topo Map _____ 1000 Ft W of EL. Ground Elevation 635

Field Located By Rowberry Date ISBH 8/12/81 2450 Ft N of SL. Depth to bedrock _____

Courthouse Location By _____ Date _____ _____ Ft E of WL. Bedrock elevation _____

Location accepted w/o verification by _____ _____ Ft S of NL. Aquifer elevation 560 Lot Number _____

GW STRATEGY PROJECT - ISBH

IWRS

WATER WELL LOG

To	From	FORMATIONS (Color, type of material, hardness, etc.)
7	0	Soil
19	7	Sand
62	19	Gray Shale
74	62	Clean Sand

635
560

(33)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

595815
05225

WWRS

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner American Chemical Co Address Cleveland Street Griffith, In

Building Contractor Address

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service Inc.

Address 9203 Kennedy Ave - Highland - Indiana 46322

Name of Drilling Equipment Operator: Everett Farmer

WELL INFORMATION

Depth of well: 265 ft Date well was completed: Feb. 24-1972

Diameter of casing or drive pipe: 4" Total Length: 131'

Diameter of liner (if used): Total Length:

Diameter of Screen: Length: Slot Size:

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other

Use of Well: For Home ☑ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☑ Rotary ☐ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) feet

Bailer Test: Hours Tested 2 Rate g.p.m. 20 Drawdown -0- ft.

Pumping Test: Hours Tested 2 Rate g.p.m. 10 Drawdown -0- ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Adelma S. Gagliardi

Date March 13-1972

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

33

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

American Chem

COUNTY [illegible] TWP. 35N RGE. 9W SW ¼ SE ¼ NE SEC. 2 Subdivision Name

Topo Map [illegible] 1000 Ft W of EL. Ground Elevation 635

Field Located By DTK Date 7/31/86 Ft N of SL. Depth to bedrock 131

Courthouse Location By Date Ft E of WL. Bedrock elevation 504

Location accepted w/o verification by Ft S of NL. Aquifer elevation Lot Number

WWRS

Manager of Comp. verified well locations.

[4 deep wells]

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To
Soil	0	2
Clay	2	90
Clay & Sand	90	110
Shale	110	131
Limestone	131	265

☐ TEST

☐ PERMANENT

Job No. R10,120 (34)

WELL LOG No. 7 CITY Griffith County Lake

Owner Jschagin, Corp. of America-Hapes Nolded Div. Township Calumet

Section 2

Location State Indiana

From Land Description _____ ft. East and _____ ft. North of SW Corner of Section.

From Street or Road 40' N. of West Main St. 12' West of R.R. Siding South East corner of property North of Main St.

FORMATION FOUND — DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
Top Soil			1'	
Sand	1'	14'	13'	7'
Blue Clay	14'	29'	15'	
Fine Grey Sand	29'	83'	54'	19'6"
Fine muddy sand at 83'				

_____ inch diameter hole drilled by ☐ Cable Tool ☐ Rotary ☐ Jetting

Pipe left in hole

Date Started 10-22-59 Finished 11-10-59 J. Niable

RECEIVED NOV 1959 Dept. of Conservation Division of Water Resources

(34)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

TY: [illegible] TWP [illegible] RGE [illegible] ¼ ¼ ¼ SEC.

Map: [illegible]

log classified By ____ Date ____
thouse located By ____ Date ____
d located By ____ Date ____
w/o verification By ____ Date ____

Ft W of EL. Ground elevation ____
Ft N of SL. Depth to bedrock ____
Ft E of WL. Bedrock elevation ____
Ft S of NL. Aquifer elevation ____

REMARKS:

INSTRUCTIONS

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As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water

☐ PERMANENT

Did n't plot

Job No. 1110,126

WELL LOG No. 59.. CITY Griffith County Lake

Owner Packaging Corp. of America (Formerly Papes Paper Co.) Township Calumet

Section 2

Location State Indiana

From Land Description _____ ft. East and _____ ft. North of SW Corner of Section

From Street or Road 45' E. of east west st. 60' n. of southeast corner of plant

34A

FORMATION FOUND — DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
Fill	0	4	4	
Fine Sand	4	18	14	
Clay	18	32	14	
Sand	32	80	48	15'
Rocky Sand	80	86	6	

6 inch diameter hole drilled by ☒ Cable Tool ☐ Rotary ☐ Jetting

Pipe left in hole None

Date Started 10-14-59 Finished 10-21-59 G. L. Patz

DRILLER

2nd Packaging Corp Well

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

Packaging Corp

COUNTY Lake TWP. 36 N RGE. 9 W ___ ¼ ___ ¼ ___ SEC 34 35 Subdivision Name

Topo Map Highland 7½' ___ Ft W of EL. Ground Elevation ___ Lyons 59-A

Field Located By ___ Date ___ ___ Ft N of SL. Depth to bedrock ___

Courthouse Location By ___ Date ___ ___ Ft E of WL. Bedrock elevation ___

Location accepted w/o verification by ___ ___ Ft S of NL. Aquifer elevation ___ Lot Number ___

(55)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

Water sample collected by Ron Weiss

596570
466225

WWRS

5BH (16)

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake County Civil Township Calumet Twp -

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Salisbury Engineering Address Main Street - Griffith, In

Building Contractor _____ Address _____

Name of Well Drilling Contractor: John Farmer & Sons Well & Pump Service Inc.

Address 9703 Kennedy Avenue - Highland, Indiana 46322

Name of Drilling Equipment Operator: Jared A. Farmer

WELL INFORMATION

Depth of well: 82 ft Date well was completed: May 10-1972

Diameter of casing or drive pipe: 4" Total Length: 74 ft

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 3 Length: 8 ft Slot Size: .006

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) _____ feet

Bailer Test: Hours Tested 2 Rate _____ g.p.m. 20 Drawdown 0 ft.

Pumping Test: Hours Tested 2 Rate _____ g.p.m. 18 Drawdown 0 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Adelma I. Gagliardi - Secy. Treas.

Date June 14-1972

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

35

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY / / / TWP. 35N RGE. 9W NE ¼ NE ¼ NW SEC. 1 Subdivision Name

Topo Map / / / 7½

Field Located / By [illegible] Date 15B11 8/12/81

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

_____ Ft N of SL.

2200 Ft E of WL.

250 Ft S of NL.

Ground Elevation 635

Depth to bedrock _____

Bedrock elevation _____

Aquifer elevation 553

Lot Number _____

WWRS

GW STRATEGY PROJECT – ISBH

WATER WELL LOG

To	From	FORMATIONS (Color, type of material, hardness, etc.)
1	0	Soil
14	2	Clay
57	14	Sand
67	57	Gravel
74	67	Clay
82	74	Clay Gravel Sand

635
82
553

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

Water sample collected by Ron Weiss

594950
4/21/95

(36)

JBH (32)

WATER WELL RECORD

WWRS

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake County Civil Township Calumet Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner ~~Gene Gilbertson~~ Arthur Hegedus Address 1009 S. Wood Street - Griffith, In

Building Contractor _____ Address _____

Name of Well Drilling Contractor: J. Farmer & Son Well & Pump Service

Address 9703 Kennedy Ave - Highland, Indiana 46322

Name of Drilling Equipment Operator: Donald Farmer

WELL INFORMATION

Depth of well: 53 ft Date well was completed: June 5-1973

Diameter of casing or drive pipe: 3" Total Length: 48'

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 1 1/2" Length: 5 ft. Slot Size: .006

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☑ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) _____ feet

Bailer Test: Hours Tested 2 Rate 12 g.p.m. Drawdown 0 ft.

Pumping Test: Hours Tested 2 Rate 10 g.p.m. Drawdown 0 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Carlena S. Gagliardi - Secy - Treas

Date July 19-1973

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

36

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 35 N RGE. 9 W NW ¼ NW ¼ NE SEC. 11 Subdivision Name

Topo Map Highland NE

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

2630 Ft W of EL. Ground Elevation 638

_____ Ft N of SL. Depth to bedrock _____

_____ Ft E of WL. Bedrock elevation _____

150 Ft S of NL. Aquifer elevation _____ Lot Number _____

WWRS

WATER WELL LOG

To	From	FORMATIONS (Color, type of material, hardness, etc.)
2	0	Soil
21	2	Surface Sand
38	21	Blue Clay
46	38	Brown
53	46	Coarse Sand

DIVISION OF WATER RESOURCES
INDIANA DEPARTMENT OF CONSERVATION
311 WEST WASHINGTON STREET
INDIANAPOLIS, INDIANA

NOV 1959 RECEIVED Dept. of Conservation Division of Water Resources

55

Amer

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: _____

Congressional township: _____ Range: _____ Number of section: _____

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: Northwest Corner of Sater-Section Cedar + Ridge Road - Gary, Ind.

Name of owner: Mr Cash. Address: Cedar + Ridge Rd - Gary Ind.

Name of Well Drilling Contractor: John Farmer

Address: 2830-45th Street

Name of Drilling Equipment Operator: Paul Kibbert

INFORMATION ON THE WELL

Completed depth of well: 89 ft. Date well was completed: July 1-1959

Diameter of outside casing or drive pipe: 2" Length: 21 ft.

Diameter of inside casing or liner: _____ Length: _____

Diameter of Screen: 1" Length: 4 ft Slot size: 60

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☑ Other _____

Use of Well: For home ☑ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Driven ☐

Static water level in completed well (Distance from ground to water level) 12 ft ft.

Bailer Test: Hours tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 12 g.p.m. Drawdown _____ ft.

Signature John Farmer G.I. Sec

Date November 14-1959

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

FOR ADMINISTRATIVE USE ONLY
(Well Driller does not fill out)

COUNTY: Lake TWP. 36N RGE. 9W ¼ ¼ ¼ SEC. 35 36

Topo. Map: Highland 7½ Loc. accepted w/o verification Yes — No —

El. of grnd. surface at well: Courthouse Loc. By Date

Depth to bedrock: Field Located By Date

Well Log processed by: Placed in Master Well Log File Date

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To

REMARKS:

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a water well. We request that you be as accurate as possible in recording this information as it may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation, 311 West Washington Street, Indianapolis, Indiana.

(56)

DIVISION OF WATER RESOURCES
INDIANA DEPARTMENT OF CONSERVATION
311 WEST WASHINGTON STREET
INDIANAPOLIS, INDIANA

RECEIVED Dec 1959 Indiana Department of Conservation Division of Water Resources

RECEIVED NOV 1959

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: Calumet Township

Congressional township: T 36 N Range: R 9 W Number of section: 36

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks:

Name of owner: John Rosinko Address: Griffith

Name of Well Drilling Contractor: John Farmer

Address: 2830 - 45th St. Highland, Indiana

Name of Drilling Equipment Operator: Paul Kikkert

INFORMATION ON THE WELL

Completed depth of well: 71 ft. Date well was completed: Oct 13-1959

Diameter of outside casing or drive pipe: 3" Length: 21 ft

Diameter of inside casing or liner: Length:

Diameter of Screen: 1½" Length: 4 ft Slot size: 60

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☑ Other

Use of Well: For home ☑ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Driven ☐

Static water level in completed well (Distance from ground to water level) ft.

Bailer Test: Hours tested Rate g.p.m. Drawdown ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 15 g.p.m. Drawdown 25 ft.

Signature John Farmer - G.A. Sec

Date Nov. 14- 1959

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

56

(FOR ADMINISTRATIVE USE ONLY
(Well Driller does not fill out)

COUNTY: Lake TWP. 36 N RGE. 9W ___ ¼ ___ ¼ ___ ¼ SEC. 36

Topo. Map: Highland 7½' Loc. accepted w/o verification Yes ___ No ___

El. of grnd. surface at well: ___ Courthouse Loc. By ___ Date ___

Depth to bedrock: ___ Field Located By ___ Date ___

Well Log processed by: ___ Placed in Master Well Log File Date ___

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To
REMARKS:		

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a water well. We request that you be as accurate as possible in recording this information as it may be of great assistance in the planning and development of new water supplies.

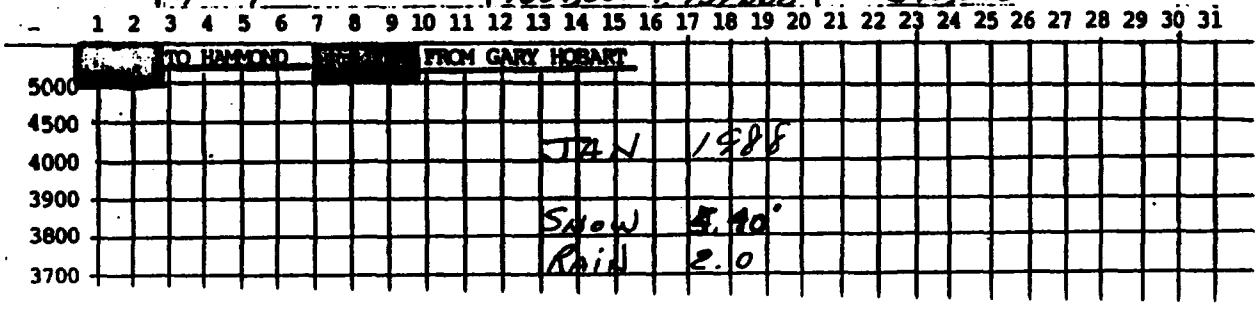
An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation, 311 West Washington Street, Indianapolis, Indiana.

APPENDIX M

Precipitation Records for Griffith, Indiana

DATE		TO HAMMOND	FROM GARY HOBART		INFILTRATION
1		2,844,000	1,468,000	1,593,000	1,251,000
2		2,122,000	1,415,000	1,540,000	582,000
3		~~1,437,000~~ 2,053,000	~~1,636,000~~ 1,661,000		~~266,000~~ 392,000
4		~~2,054,000~~ 1,927,000	~~1,536,000~~ 1,661,000	1,741,000 1,866,000	61,000
5		1,716,000	1,340,000	1,465,000	251,000
6		1,790,000	1,401,000	1,526,000	264,000
7		1,678,000	1,383,000	1,508,000	170,000
8		1,665,000	1,465,000	1,590,000	75,000
9		1,635,000	1,141,000	1,266,000	369,000
10		1,687,000	1,890,000	2,015,000	(328,000)
11		1,644,000	1,652,000	1,777,000	(138,000)
12		1,465,000	1,331,000	1,456,000	9,000
13	*0.2"	1,788,000	1,434,000	1,559,000	229,000
14		1,806,000	1,443,000	1,568,000	238,000
15	*0.5"	1,565,000	1,349,000	1,474,000	91,000
16		1,450,000	1,354,000	1,479,000	(29,000)
17		1,737,000	1,493,000	1,618,000	119,000
18	1.0	2,740,000	1,454,000	1,579,000	1,161,000
19		2,286,000	1,434,000	1,559,000	727,000
20	1.0"	3,049,000	1,369,000	1,494,000	1,556,000
21		2,543,000	1,356,000	1,481,000	1,062,000
22	*0.1"	3,067,000	1,323,000	1,448,000	1,619,000
23		2,274,000	1,267,000	1,392,000	882,000
24	*2.0"	2,154,000	1,350,000	1,475,000	679,000
25	*1.0"	2,023,000	1,411,000	1,536,000	487,000
26	*0.5"	1,926,000	1,373,000	1,498,000	428,000
27	*0.6"	1,836,000	1,364,000	1,489,000	347,000
28		1,784,000	1,372,000	1,504,000	280,000
29		1,494,000	1,368,000	1,493,000	301,000
30		2,107,000	1,480,000	1,605,000	502,000
31		2,272,000	1,606,000	1,731,000	540,000



Feb 1988

Rain 0.9
snow 23.95

Day		To Hammond	From Gary Hobart		Infiltration
1	0.1"	2.896,000	1,282,000	1,407,000	1,489,000
2	*1.5"	2.640,000	1,607,000	1,732,000	908,000
3		2.526,000	1,410,000	1,535,000	991,000
4	4.0"	2,283,000	1,337,000	1,462,000	821,000
5	0.2"	2,234,000	1,314,000	1,439,000	795,000
6		2,237,000	1,328,000	1,453,000	784,000
7		2148,000	1,390,000	1515,000	633,000
8		1,799,000	1412,000	1,542,000	257,000
9	*1.0"	1,731,000	1,418,000	1,543,000	194,000
10	*2.25"	1,726,000	1,350,000	1,475,000	251,000
11	*5.0"	1,592,000	1,315,000	1,440,000	152,000
12	*9.0"	1,528,000	1,344,000	1,471,000	57,000
13		1,518,000	1,318,000	1,443,000	75,000
14		1,586,000	1,462,000	1,587,000	(1,000)
15	0.6"	2,507,000	1,396,000	1,521,000	986,000
16	0.2"	2778,000	1,483,000	1,608,000	1,170,000
17		2,282,000	1,355,000	1,480,000	802,000
18		2,485,000	1,305,000	1,430,000	1,055,000
19		2,555,000	1,310,000	1,495,000	1,060,000
20	*0.5"	2514,000	1,349,000	1,474,000	1,040,000
21	*0.5"	2,253,000	1,381,000	1,506,000	747,000
22		2,045,000	1,458,000	1,583,000	462,000
23		2,728,000	1,488,000	1,543,000	1,180,000
24		2,412,000	1,434,000	1,559,000	853,000
25		2,150,000	1,303,000	1,428,000	722,000
26		1971,000	1,348,000	1,473,000	498,000
27		2054000	1,362,000	1,487,000	567,000
28		1,906,000	1,405,000	1,530,000	376,000
29		1,954,000	1,481,000	1,606,000	348,000

5.3" Rain

MONTHLY INFILTRATION
MONTH MARCH 1988

DATE		TO HAMMOND	FROM GREY HOBART	INFILTRATION
1		1984,000	1,403,000 1528,000	456,000
2		1,853,000	1,356,000 1,481,000	372,000
3		1,967,000	1,381,000 1,506,000	461,000
4		1,886,000	1,380,000 1,505,000	381,000
5		1,951,000	1,388,000 1,513,000	438,000
6		1,866,000	1,405,000 1,530,000	336,000
7		1,771,000	1,459,000 1584,000	187,000
8		1,947,000	1,458,000 1583,000	364,000
9	0.1"	2,040,000	1,402,000 1527,000	517,000
10		1,949,000	1,450,000 1,575,000	374,000
11		1,873,000	1,429,000 1,554,000	319,000
12		1,804,000	1,299,000 1,424,000	380,000
13	0.5"	1,893,000	1,435,000 1,560,000	273,000
14	0.3"	1,806,000	1,463,000 1,588,000	218,000
15	0.2"	1,891,000	1,352,000 1,477,000	414,000
16		1,781,000	1,344,000 1,469,000	312,000
17		1,673,000	1,321,000 1446,000	227,000
18		1,552,000	1,395,000 1,520,000	32,000
19		1,565,000	1,366,000 1,491,000	74,000
20	0.1"	1,542,000	1,275,000 1,400,000	142,000
21		1,498,000	1,551,000 1,676,000	(178,000)
22		1,642,000	1,394,000 1,519,000	123,000
23		1,622,000	1,391,000 1,516,000	106,000
24	0.5"	1,793,000	1,414,000 1539,000	254,000
25	0.3"	2,298,000	1,321,000 1,446,000	847,000
26	0.2"	2,110,000	1,439,000 1,564,000	546,000
27		2,029,000	1,360,000 1,485,000	544,000
28	0.3"	1,881,000	1,338,000 1,463,000	418,000
29	1.3"	3,200,000	1,223,000 1,348,000	1,852,000
30	1.5"	3,598,000	1,340,000 1,465,000	2,133,000
31		3438,000	1,351,000 1,476,000	1,962,000

5.20 Rain

MONTHLY INFILTRATION

MONTH APRIL 1988

DATE		TO HAMMOND	FROM GREY HOBART	INFILTRATION
1		3,574,000	1,313,000 1,438,000	2,096,000
2	0.2"	3,305,000	1,269,000 1,394,000	1,911,000
3	0.5	3,416,000	1,407,000 1,532,000	1,784,000
4	0.5	3,526,000	1,261,000 1,386,000	2,140,000
5		3,165,000	1,318,000 1,443,000	1,722,000
6	0.15"	3,456,000	1,284,000 1,409,000	2,047,000
7	2.0"	3,161,000	1,304,000 1,429,000	1,732,000
8		3,519,000	1,295,000 1,420,000	2,099,000
9		3,491,000	1,318,000 1,443,000	2,048,000
10		3,330,000	1,392,000 1,517,000	1,813,000
11		3,036,000	1,481,000 1,606,000	1,430,000
12		2,911,000	1,382,000 1,507,000	1,404,000
13		2,671,000	1,341,000 1,466,000	1,205,000
14	0.05"	2,477,000	1,394,000 1,519,000	958,000
15		2,214,000	1,329,000 1,454,000	760,000
16		2,075,000	1,284,000 1,409,000	666,000
17		2,068,000	1,425,000 1,548,000	520,000
18	0.15"	2,082,000	1,521,000 1,646,000	436,000
19		1,925,000	1,390,000 1,515,000	410,000
20		1,771,000	1,397,000 1,522,000	149,000
21	0.15"	1,755,000	1,334,000 1,459,000	296,000
22	0.1"	1,747,000	1,334,000 1,459,000	288,000
23	0.2"	1,716,000	1,446,000 1,621,000	95,000
24		1,683,000	1,404,000 1,529,000	154,000
25		1,736,000	1,451,000 1,576,000	160,000
26		1,778,000	1,104,000 1,229,000	549,000
27	0.3"	1,772,000	1,483,000 1,608,000	164,000
28	0.3	1,943,000	1,511,000 1,636,000	307,000
29			1,330,000 1,455,000	331,000
30		1,786,000	1,330,000 1,455,000	331,000
31				

RAINFALL.
2.6"

MONTHLY INFILTRATION
MONTH MAY, 1988

DATE		TO HAMMOND	FROM GREY HOBART		INFILTRATION
1		1562,000	1437,000	1562,000	—
2		1,315,000	1,751,000	1,876,000	(561,000)
3		1.492 000	1.691,000	1,816,000	(324000)
4		1.413, 000	1,570,000	1695,000	(282,000)
5		1270 .000	1.396,000	1,521,000	(251 000)
6		1.597000	1.619000	1,744,000	(147000)
7		1629000	1644000	1769,000	(140,000)
8		1.509,000	1.806,000	1931,000	(422,000)
9	0.3	1507000	1625,000	1.750,000	(243,000)
10	0.1	1668 000	1504,000	1.629,000	39,000
11		1.514000	1,432,000	1557,000	(43,000)
12		1,534,000	1.559,000	1.684000	(150,000)
13		1,373,000	1727000	1.852,000	(479000)
14		1.434,000	1.560,000	1685,000	(251,000)
15		1420,000	2034000	2159000	(739,000)
16	0.2	1267000	1722000	1847,000	(580,000)
17		1.405,000	1.649000	1774000	(369,000)
18		1.357,000	1,708,000	1,833,000	(476,000)
19		1.420,000	1980,000	2105,000	(685,000)
20		1.350 000	2004000	2129,000	(779,000)
21		1,413,000	2084000	2209000	(796,000)
22		1.271,000	2346,000	2471,000	(1200, 000)
23		1,274,000	2073,000	2198,000	(924,000)
24	2.0	1,966,000	1.586,000	1711,000	255,000
25		1.884000	1.432,000	1557,000	327,000
26		1,625,000	1560,000	1685,000	(60,000)
27		1533000	1796,000	1921,000	(388000)
28		1,472,000	1984000	2109000	(637,000)
29		1313 000	2226,000	2351,000	(1.038,000)
30		1,272,000	2530,000	2655,000	(1.383,000)
31		1,281,000	2538,000	2663,000	(1,427,000)

RAIN FALL
2.3'

MONTHLY INFILTRATION
MONTH JUNE 1988

DATE	TO HAMMOND	FROM GREY HOBART	INFILTRATION
1	1,357,000	2676,000 2844,000	(444000)
2	1,369,000	2509,000 2634,000	(1245,000)
3	1218,000	2116,000 2241,000	(1023,000)
4	1144,000	1585,000 2110,000	(966,000)
5	1164,000	2653,000 2777,000	(1813,000
6	1234,000	2638,000 2763,000	(1529,000)
7	1245,000	2758,000 2883,000	(1638,000)
8	1266,000	2779,000 2904,000	(1628,000)
9	1295,000	2339,000 2464,000	(1,171,000)
10	1229,000	2089,000 2214,000	(1,085,000)
11	1,311,000	517,000 1,042,000	731,000
12	1,230,000	—	—
13	1,121,000	—	—
14	1,270,000	2363,000 2488,000	(1,218,000)
15	1394,000 ~~Rt~~	~~METERS~~	~~Rt~~
16	~~1,459,000~~ ~~STOPPED~~	~~2[illegible]~~	
17	1,392,000	1,606,000 1,731,000 ~~2450,000 2575,000~~	(339,000)
18	1,370,000	1,890,000 2015,000 ~~2534,000 2679,000~~	(645,000)
19	1,244,000	2346,000 2471,000	(1225,000)
20	1,111,000	2137,000 2262,000	(1,151,000)
1.5 21	1,497,000	1,856,000 1981,000	(484,000)
22	513,000	1,777,000 1902,000	1,384,000
23	STOPPED	1,853,000 1,978,000	
24	STOPPED	1,896,000 2021,000	
25	"	1,942,000 2067,000	
26	"	2,181,000 2306,000	
27	"	1,836,000 1,961,000	
28	"	2379,000 2504,000	
0.8' 29	"	2351,000 2476,000	
30	"	1,638,000 1763,000	
31			

RAIN FALL 4.3"

MONTHLY INFILTRATION
MONTH July 88'

	DATE	TO HAMMOND	FROM GREY HOBART	INFILTRATION
	1	STOPPED	1,847,000 1972,000	
	2	"	2230,000 2355,000	
	3	"	1,999,000 2124,000	
	4	"	1,891,000 2022,000	
	5	"	2,099,000 2224,000	
	6	"	2744,000 2,869,000	
	7	"	2892,000 3017,000	
	8	"	2655,000 2778,000	
	9	"	2,635,000 2760,000	
	10	"	2539,000 2664,000	
	11	"	1,901,000 2026,000	
	12	"	2,602,000 2727,000	
	13		2795,000 2,920,000	
	14		2620,000 2,745,000	
	15		2793,000 2,918,000	
	16		2822,000 2947,000	
	17		2150,000 2275,000	
	18		2554,000 2679,000	
1.5"	19		1,634,000 1,759,000	
	20		1,771,000 1,896,000	
0.6"	21		1,572,000 1,697,000	
	22		1,728,000 1,853,000	
	23		1,764,000 1,889,000	
	24		1,904,000 2,029,000	
0.1"	25		1,913,000 2,038,000	
0.1"	26		1,686,000 1,811,000	
	27		1,943,000 2,068,000	
	28		2,112,000 2237,000	
	29	853,000	2,466,000 2591,000	
	30	1,453,000	2070,000 2195,000	(756,000)
2.0"	31	1,520,000	1,637,000 1762,000	(242,000)

RAINFALL = 8"

MONTHLY INFILTRATION
MONTH AUGUST

	DATE	TO HAMMOND	FROM GREY HOBART	INFILTRATION
	1	1,094,000	1658,000 1783,000	(693,000)
	2	1147,000	2123,000 2248,000	(1,101,000)
	3	1.213,000	2259,000 2,384,000	(1,171,000)
1.0	4	1,480,000	1,810,000 1935,000	(455,000)
	5	1.267,000	1.844,000 1969,000	(702,000)
	6	1,262,000	1,810,000 1.935,000	(673,000)
	7	1.151,000	1,923,000 2048,000	(997,000)
	8	1.056,000	1,902,000 2027,000	(971,000)
3.5"	9	2,223,000	1,937,000 2,062,000	161,000
0.1	10	2.322,000	1.572,000 1,697,000	625,000
1.5"	11	2.606,000	1.724,000 1.894,000	757,000
	12	1,928,000	1,827,000 1952,000	24,000
	13	1,688,000	1.927,000 2052,000	(364,000)
0.3"	14	1.515,000	1,880,000 2005,000	(490,000)
	15	1.291,000	1.886,000 2011,000	(720,000)
0.1"	16	1,619,000	1.784,000 1909,000	(290,000)
	17	1530,000	1.953,000 2078,000	(548,000)
	18	1.406,000	2,001,000 2126,000	(720,000)
0.1	19	1.403,000	1,700,000 1.825,000	(422,000)
	20	1,948,000	1.507,000 1,632,000	(284,000)
	21	1270,000	1,791,000 1922,000	(652,000)
	22	1,133,000	1,791,000 1916,000	(783,000)
0.15"	23	1,364,000	1.597,000 1,722,000	(358,000)
	24	1,273,000	1.666,000 1,791,000	(518,000)
	25	1244,000	1,777,000 1.902,000	(658,000)
	26	1217,000	1,939,000 2.064,000	(847,000)
1.25"	27	1.208,000	1.823,000 1948,000	(615,000)
	28	1.750,000	1,492,000 1,617,000	33,000
	29	1,148,000	1,525,000 1.650,000	(502,000)
	30	1,362,000	1,647,000 1,772,000	(410,000)
	31	1,223,000	1,597,000 1722,000	(499,000)

RAINFALL 2.50"

MONTHLY INFILTRATION
MONTH SEPT - 88

DATE		TO HAMMOND	FROM GREY HOBART	INFILTRATION
1		1356000	1734000 1859000	(503,000)
2		1250,000	1,684,000 1,809000	(559,000)
3		1,256,000	1,595,000 1,720,000	(464,000)
4	0.4	1,207,000	1572000 1697,000	(489,000)
5	0.4"	934,000	1316,000 1441,000	(507,000)
6		1038,000	1,528,000 1,653,000	(615,000)
7		1,292,000	1,489000 1,614000	(422,000)
8		1263,000	1,621,000 1,746,000	(483,000)
9		1238,000	1,595,000 1720,000	(482,000)
10		1,192,000	1,674,000 1799,000	(607,000)
11		1,241,000	1,783000 1908,000	(667,000)
12		1,270,000	1,837,000 1962,000	(692,000)
13		1,282,000	1,664,000 1789,000	(507,000)
14		1263, 1263000	1,667,000 1792,000	(529,000)
15		1285,000	1,773000 1898,000	(613,000)
16		1,312,000	1,702,000 1827,000	(515,000)
17		1310,000	1,469,000 1594,000	(284,000)
18		1,382,000	1,930,000 2055,000	(673,000)
0.3" 19	0.3"	1,281,000	1,663000 1788,000	(507,000)
20	0.9"	1,616,000	1,483000 1,608,000	8,000
21		1,259,000	1,416,000 1541,000	(282000)
22	0.2"	1,225,000	1,461,000 1586,000	(361,000)
23	0.2"	1,330,000	1,462,000 1587,000	(257,000)
24		1,345,000	1,454000 1579,000	(234000)
25		1,156,000	1,497,000 1622,000	(466,000)
26		1,041,000	1,462,000 1587,000	(546,000)
27		1,414,000	1,682,000 1807,000	(393,000)
28	0.1	1,438,000	1,593,000 1718,000	(280,000)
29		1,314,000	1500,000 1625,000	(311,000)
30		1,199,000	1571,000 1696,000	(497,000)
31				

OCT 1988

RAIN FALL 7.35

MONTHLY INFILTRATION

MONTH

DATE		TO HAMMOND	FROM GREY HOBART	INFILTRATION
1		1208000	1534000 1659000	(451,000)
2	1.5"	1469000	1543000 1668000	(199000)
3	0.2"	1264000	1534000 1659000	(395000)
4	0.1	1288000	1620000 1745000	(457000)
5		1471000	1436000 1561000	(90000)
6		1461000	1553000 1678000	(217000)
7		1319000	1419000 1544000	(225000)
8		1344000	1493000 1618000	(224000)
9		1211000	1509000 1634000	(423000)
10		1245000	1685000 1810000	(565000)
11		1286000	1501000 1626000	(340000)
12		1147000	1487000 1612000	(465000)
13		1190000	1418000 1543000	(353000)
14		1343000	1409000 1534000	(191000)
15		1320000	1570000 1695000	(375000)
16	0.5"	1300000	1601000 1726000	(426000)
17	0.2"	1316000	1544000 1669000	(403000)
18	3.5"	2757000	1445000 1570000	1187000
19		2297000	1395000 1520000	813000
20		1807000	1455000 1580000	227000
21	0.25"	1735000	1361000 1486000	249000
22	0.1"	1788000	1412000 1537000	251000
23	0.4"	1583000	1523000 1648000	(65000)
24	0.5"	1895000	1502000 1627000	268000
25		1697000	1466000 1591000	106000
26		1572000	1465000 1590000	(18000)
27	0.1"	1469000	1474000 1599000	(130000)
28		1531000	1360000 1485000	46000
29		1469000	1474000 1599000	(130000)
30		1477000	1481000 1606000	(129000)
31		1625000	1546000 1671000	(46000)

MONTHLY INFILTRATION

MONTH NOV 1988

+125,000 PRODUCING WELL

DATE	TO HAMMOND	FROM GREY HOBART	INFILTRATION	
	601,000	1,320,000 1,445,000	156,000	
	63,000	1,400,000 1,525,000	138,000	
	441,000	1,344,000 - 1,469,000	- 28,000	
	407,000	1,370,000 - 1,495,000	- 88,000	
5	1,819,000	1,337,000 - 1,462,000	+ 357,000	1.0" RAIN
6	1,422,000	1,450,000 - 1,575,000	- 153,000	2.0" SNOW
7	1,486,000	1,504,000 - 1,629,000	- 143,000	0.5" SNOW
8	1,442,000	1,373,000 - 1,498,000	- 76,000	0.1" RAIN
9	1,476,000	1,325,000 - 1,450,000	+ 26,000	
10	2,697,000	1,347,000 - 1,472,000	+ 1,225,000	2.2" RAIN
11	3,146,000	1,340,000 - 1,465,000	+ 1,681,000	0.1" RAIN
12	2,848,000	1,314,000 - 1,439,000	+ 1,409,000	
13	3,413,000	1,478,000 - 1,603,000	+ 1,810,000	0.9" RAIN
14	3,044,000	1,538,000 - 1,663,000	+ 1,381,000	
15	2,555,000	1,367,000 - 1,492,000	+ 1,063,000	
16	2,820,000	1,358,000 - 1,483,000	+ 1,337,000	0.8" RAIN
17	3,106,000	1,401,000 - 1,526,000	+ 1,580,000	
18	2,489,000	1,312,000 - 1,437,000	+ 1,052,000	
19	2,631,000	1,286,000 - 1,411,000	+ 1,220,000	1.0" RAIN
20	3,063,000	1,251,000 - 1,376,000	+ 1,687,000	0.2" RAIN
21	3,156,000	1,546,000 - 1,673,000	+ 1,483,000	0.2 RAIN
22	2,707,000	1,365,000 - 1,490,000	+ 1,217,000	
23	2,515,000	1,470,000 - 1,595,000	+ 920,000	
24	2,416,000	1,340,000 - 1,465,000	+ 951,000	
25	1,959,000	1,335,000 - 1,460,000	+ 499,000	
26	1,773,000	1,275,000 - 1,400,000	+ 373,000	0.3 RAIN
27	2,100,000	1,354,000 - 1,479,000	+ 621,000	0.3 RAIN
28	2,199,000	1,446,000 - 1,571,000	+ 628,000	0.5 SNOW
29	2,227,000	1,361,000 - 1,486,000	+ 741,000	
30	2,045,000	1,296,000 - 1,421,000	+ 624,000	
31				

[illegible] TO HAMMOND
[illegible] GARY-HOBART.

MONTHLY INFILTRATION

MONTH — DECEMBER 1988

[illegible]E	TO HAMMOND	FROM GARY HOBART (+ 125,000 - WELL - PACKAGE)	INFILTRATION	
[illegible]	1,928,000	1,388,000 - 1,513,000	+ 415,000	0.[illegible]" [illegible]
[illegible]	[illegible]54,000	1,323,000 - 1,448,000	+ 406,000	
[illegible]	[illegible]55,000	1,305,000 - 1,430,000	+ 425,000	
[illegible]	[illegible]30,000	1,416,000 - 1,541,000	+ 289,000	
5	1,[illegible]93,000	1,441,000 - 1,566,000	+ 227,000	
6	1,780,000	1,402,000 - 1,527,000	+ 253,000	
7	1,783,000	1,322,000 - 1,447,000	+ 336,000	
8	1,657,000	1,360,000 - 1,485,000	+ 172,000	
9	1,736,000	1,335,000 - 1,460,000	+ 276,000	
10	1,699,000	1,228,000 - 1,353,000	+ 346,000	1.0" Snow
11	1,544,000	1,423,000 - 1,548,000	- 4,000	1.0" Snow
12	1,476,000	1,469,000 - 1,594,000	- 118,000	2.0" Snow
13	1,592,000	1,386,000 - 1,511,000	+ 81,000	1.0" Snow
14	1,550,000	1,389,000 - 1,514,000	+ 36,000	
15	1,538,000	1,378,000 - 1,503,000	+ 35,000	
16	1,476,000	1,364,000 - 1,489,000	- 13,000	
17	1,535,000	1,367,000 - 1,492,000	+ 43,000	1.0" Snow
18	1,423,000	1,408,000 - 1,533,000	- 110,000	0.25" Snow
19	1,387,000	1,528,000 - 1,653,000	- 266,000	
20	1,552,000	1,396,000 - 1,521,000	+ 31,000	0.1" Rain
21	1,505,000	1,423,000 - 1,548,000	- 43,000	
22	1,426,000	1,280,000 - 1,405,000	- 21,000	
23	2,585,000	1,376,000 - 1,501,000	+ 1,084,000	1.5" Rain
24	2,616,000	1,456,000 - 1,581,000	+ 1,035,000	
25	2,326,000	1,466,000 - 1,591,000	+ 735,000	
26	1,818,000	1,220,000 - 1,345,000	+ 473,000	7.0" Snow
27	2,066,000	1,423,000 - 1,548,000	+ 518,000	.5" Rain
28	3,476,000	1,400,000 - 1,525,000	+ 1,951,000	.4" Rain
29	3,005,000	1,418,000 - 1,543,000	+ 1,462,000	
30	2,521,000	1,371,000 - 1,496,000	+ 1,025,000	
31	2,223,000	1,422,000 - 1,547,000	+ 676,000	

MONTH JANUARY – 1989

+-125,000-WELL (PACKAGE INC)

DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRATION	
1	1,9[illegible],000	1,405,000-1,530,000	+391,000	
[illegible]	1,6[illegible]3,000	1,284,000-1,409,000	+204,000	
[illegible]	1,[illegible]3,000	1,422,000-1,547,000	+156,000	
[illegible]	1,[illegible],000	1,413,000-1,538,000	+229,000	
5	1,820,000	1,373,000-1,498,000	+322,000	
6	2,621,000	1,410,000-1,535,000	+1,086,000	0.8" [illegible]
7	2,876,000	1,242,000-1,367,000	+1,509,000	0.1" [illegible]
8	3,376,000	1,425,000-1,550,000	+1,826,000	
9	2,876,000	1,503,000-1,628,000	+1,248,000	
10	2,445,000	1,362,000-1,487,000	+ 958,000	
11	2,239,000	1,346,000-1,471,000	+ 768,000	
12	2,443,000	1,366,000-1,491,000	+ 952,000	0.2" RAI[illegible]
13	2,321,000	1,317,000-1,442,000	+ 879,000	
14	2,031,000	1,340,000-1,465,000	+ 566,000	1.2" SNO[illegible]
15	2,026,000	1,451,000-1,576,000	+ 450,000	
16	1,910,000	1,481,000-1,606,000	+ 304,000	
17	1,911,000	1,422,000-1,547,000	+ 364,000	
18	1,872,000	1,371,000-1,496,000	+ 376,000	
19	1,826,000	1,361,000-1,486,000	+ 340,000	
20	1,854,000	1,376,000-1,501,000	+ 353,000	
21	1,853,000	1,319,000-1,444,000	+ 409,000	
22	1,861,000	1,396,000-1,521,000	+ 340,000	
23	1,823,000	1,511,000-1,636,000	+ 187,000	
24	1,760,000	1,372,000-1,497,000	+ 263,000	
25	1,850,000	1,363,000-1,488,000	+ 362,000	
26	2,024,000	1,330,000-1,455,000	+ 569,000	0.3" RAIN
27	2,092,000	1,335,000-1,460,000	+ 632,000	
28	1,901,000	1,325,000-1,450,000	+ 451,000	
29	1,842,000	1,372,000-1,497,000	+ 345,000	0.3" RAIN
30	1,990,000	1,488,000-1,613,000	+ 377,000	0.1" RAIN
31	2,030,000	1,336,000-1,461,000	+ 569,000	

MONTH FEBRUARY-'89

+-125,000-WELL (PACKAGEING)

DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRATION	
	1,[illegible]90,000	1,340,000 - 1,465,000	+525,000	
	1,[illegible]36,000	1,294,000 - 1,419,000	+467,000	.05"-
	1,[illegible]33,000	1,292,000 - 1,417,000	+416,000	1.5"-
	1,[illegible]08,000	1,346,000 - 1,471,000	+237,000	5.0"-
5	1,608,000	1,352,000 - 1,477,000	+131,000	6.0"- SNOW
6	1,648,000	1,450,000 - 1,575,000	+73,000	3.0"- SNOW
7	1,680,000	1,332,000 - 1,457,000	+223,000	
8	1,670,000	1,367,000 - 1,492,000	+178,000	
9	1,634,000	1,279,000 - 1,404,000	+230,000	
10	1,621,000	1,407,000 - 1,532,000	+89,000	
11	1,613,000	1,283,000 - 1,408,000	+205,000	
12	1,508,000	1,362,000 - 1,487,000	+21,000	
13	1,502,000	1,464,000 - 1,589,000	(-87,000)	2.0" SNOW
14	1,627,000	1,375,000 - 1,500,000	+127,000	
15	1,559,000	1,320,000 - 1,445,000	+114,000	1.0" SNOW
16	1,627,000	1,385,000 - 1,510,000	+117,000	0.7" SNOW & RAIN
17	1,663,000	1,310,000 - 1,435,000	+228,000	
18	1,701,000	1,239,000 - 1,364,000	+337,000	
19	1,680,000	1,464,000 - 1,589,000	+91,000	
20	1,670,000	1,442,000 - 1,567,000	+103,000	0.8" SNOW
21	1,746,000	1,414,000 - 1,539,000	+207,000	
22	1,746,000	1,372,000 - 1,497,000	+249,000	
23	1,726,000	1,378,000 - 1,503,000	+223,000	12.0" SNOW
24	1,680,000	1,324,000 - 1,449,000	+231,000	
25	1,711,000	1,355,000 - 1,480,000	+231,000	
26	1,893,000	1,366,000 - 1,491,000	+402,000	0.2" SNOW
27	1,937,000	1,416,000 - 1,541,000	+396,000	
28	1,990,000	1,337,000 - 1,462,000	+528,000	0.3" SNOW
29				
30				
31				

TOTAL { 0.5" RAIN
[illegible].0" SNOW

MONTH - MARCH - 1989

+-125,000-WELL (PACKAGEING)

DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRATION	
1	1,959,000	1,416,000 - 1,541,000	+ 418,000	
2	1,934,000	1,313,000 - 1,438,000	+ 496,000	
3	1,894,000	1,340,000 - 1,465,000	+ 429,000	
4	2,153,000	1,317,000 - 1442,000	+ 711,000	0.4 [illegible]
5	3,192,000	1437,000 - 1552,000	+ 1,640,000	0.2 [illegible]
6	2,961,000	1441,000 - 1566,000	+ 1395,000	0.2 Rain
7	2635,000	1464,000 - 1589,000	+ 1,046,000	
8	2578,000	1390,000 1515,000	+ 1,063,000	
9	2414,000	1357,000 1482,000	+ 932,000	
10	2739,000	1377,000 1,502,000	+ 1,227,000	
11	3,140,000	1,334,000 1,459,000	+ 1681,000	
12	3,138,000	1,419,000 1,544,000	+ 1594,000	
13	2,946,000	1,555,000 1,680,000	+ 1,266,000	
14	2763,000	1356,000 1,481,000	+ 1,282,000	
15	2875,000	1320,000 1,445,000	+ 1430,000	
16	2672,000	1373,000 1,498,000	+ 1,174,000	
17	2498,000	1397,000 1,522,000	+ 976,000	
18	3045,000	1320,000 1,445,000	+ 1600,000	0.8 Rain 0.3 [illegible]
[illegible]	2945,000	1346,000 1,471,000	+ 1474,000	
[illegible]	2548,000	1500,000 1625,000	+ 923,000	0.1 Rain
[illegible]	2671,000	1395,000 1520,000	+ 1151,000	0.2 Rain 1.0 snow
[illegible]	2611,000	1432,000 1557,000	+ 1054,000	
[illegible]	2421,000	1363,000 1488,000	+ 933,000	
	2,295,000	1,340,000 - 1,465,000	+ 830,000	
25	2,116,000	1,313,000 - 1,438,000	+ 678,000	
	1,895,000	1,481,000 - 1,606,000	+ 289,000	
	1,676,000	1,355,000 - 1,480,000	+ 196,000	
	1,869,000	1,428,000 - 1,553,000	+ 316,000	0.4" Rain
	2953,000	1,340,000 - 1,465,000	+ 1,488,000	0.7 Rain
	[illegible]	1414,000 1539,000	1,391,000	

MONTH APRIL - 1988

+-125,000-WELL (PACKAGEING)

DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRATION	
1	2,449,000	1,391,000-1,516,000	+933,000	
2	2,154,000	1,312,000-1,439,000	+717,000	
3	2,674,000	1,442,000-1,567,000	+1,107,000	0.8" RAIN
4	3,080,000	1,380,000-1,505,000	+1,575,000	0.5" RAIN
5	3,024,000	1,395,000-1,520,000	+1,504,000	0.2" RAIN
6	2,672,000	1,368,000-1,493,000	+1,179,000	0.1" RAIN
7	2,664,000	1,363,000-1,488,000	+1,176,000	
8	2,493,000	1,369,000-1,494,000	+999,000	
9	2,282,000	1,401,000-1,526,000	+756,000	0.2" RAIN
10	2,018,000	1,490,000-1,615,000	+403,000	
11	2,147,000	1,400,000-1,525,000	+622,000	
12	2,069,000	1,373,000-1,498,000	+571,000	
13	2,010,000	1,336,000-1,461,000	+549,000	
14	1,938,000	1,346,000-1,471,000	+467,000	
15	1,888,000	890,000	MALFUNCTION REPORTED TO GARY-HOBART 4-17-89 7:30 AM C. Hendricks	
16	1,759,000	119,000 GARY-HOBART METER		0.1"-RAIN
17	1,827,000	141,000		
18	1,970,000	1,288,000-1,413,000	+557,000	0.3"-RAIN
19	2,143,000	1,336,000-1,461,000	+682,000	0.4"-RAIN
20	2,020,000	1,440,000-1,565,000	+455,000	
21	1,937,000	1,350,000-1,475,000	+462,000	
22	1,870,000	1,402,000-1,527,000	+343,000	
23	1,876,000	1,467,000-1,592,000	+284,000	
24	1,864,000	1,628,000-1,753,000	+111,000	
25	1,834,000	1,575,000-1,700,000	+134,000	
26	1,967,000	1,444,000-1,569,000	+398,000	
27	1,797,000	1,502,000-1,627,000	+170,000	
28	1,908,000	1,418,000-1,543,000	+365,000	0.5"RA
29	2,050,000	1,348,000-1,473,000	+577,000	
30	1,805,000	1,478,000-1,603,000	+202,000	

MONTH MAY - 1988 (89)

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRATION
	1	1,805,000	1,655,000-1,780,000	+25,000
0.2"	2	1,715,000	1,373,000-1,498,000	+217,000
0.15"	3	1,807,000	1,390,000-1,515,000	+292,000
	4	1,610,000	1,405,000-1,530,000	+ 80,000
0.3" RAIN	5	1,654,000	1,386,000-1,511,000	+143,000
	6	1,500,000	1,426,000-1,551,000	(-51,000)
0.5" WATER (SNOW)	7	1,544,000	1,446,000-1,571,000	(-27,000)
	8	1,816,000	1,515,000-1,640,000	+176,000
.3" RAIN	9	1,873,000	1,505,000-1,630,000	+243,000
	10	1,658,000	1,380,000-1,505,000	+153,000
	11	1,550,000	1,550,000-1,675,000	(-125,000)
	12	1,524,000	1,411,000-1,536,000	(-12,000)
0.1" RAIN	13	1,403,000	1,431,000-1,556,000	(-153,000)
0.1" RAIN	14	1,485,000	1,375,000-1,500,000	(-15,000)
	15	1,548,000	1,655,000-1,780,000	(-232,000)
	16	1,526,000	1,590,000-1,715,000	(-189,000)
	17	1,614,000	1,687,000-1,812,000	(-198,000)
	18	1,495,000	1,791,000-1,916,000	(-421,000)
0.1" RAIN	19	1,451,000	1,513,000-1,638,000	(-187,000)
0.2" RAIN	20	2,274,000	1,380,000-1,505,000	+769,000
	21	1,863,000	1,546,000-1,671,000	+192,000
	22	1,766,000	1,818,000-1,943,000	(-177,000)
	23	1,820,000	1,601,000-1,726,000	+94,000
	24	1,698,000	1,740,000-1,865,000	(-167,000)
1.5" RAIN	25	1,787,000	1,529,000-1,654,000	+133,000
0.2" RAIN	26	2,637,000	1,647,000-1,772,000	+865,000
	27	1,856,000	1,559,000-1,684,000	+172,000
	28	1,598,000	1,591,000-1,716,000	(-118,000)
1.5" RAIN	29	1,593,000	1,524,000-1,649,000	(-56,000)
1.0" RAIN	30	2,918,000	1,492,000-1,617,000	+1,301,000
0.3" RAIN	31	2,653,000	1,652,000-1,777,000	+876,000

MONTH JUNE - 1989

	DATE	TO HAMMOND	FROM GARY-HOBART (+-125,000-WELL (PACKAGEING))	INFILTRATION
	1	TWO DAY READINGS		
7.3" RAIN	2	6,566,000	3,007,000=3,257,000	+ 3,309,000
	3	3,264,000	1,497,000=1,622,000	+ 1,642,000
2.9"	4	3,272,000	1,584,000=1,709,000	+ 1,563,000
	5	3,311,000	1,773,000=1,898,000	+ 1,413,000
	6	3,236,000	1,593,000=1,718,000	+ 1,518,000
	7	3,170,000	1,668,000=1,793,000	+ 1,377,000
	8	3,053,000	1,784,000=1,909,000	+ 1,144,000
	9	3,110,000	1,670,000=1,795,000	+ 1,315,000
	10	2988,000	1,561,000=1686,000	1,232,000
	11	2,336,000	1,465,000=1590,000	746,000
0.7" RAIN	12	2,348,000	1,773,000=1898000	+ 450,000
0.4" RAIN	13	2974,000	1483000=1608000	+ 1,366,000
	14	2757,000	1448,000=1573000	+ 1,184,000
	15	2,535,000	1,533,000=1,658,000	+ 877,000
1" RAIN	16	2,246,000	1,480,000=1,605,000	+ 641,000
.3" RAIN	17	2,221,000	1,464,000=1,589,000	+ 632,000
	18	2,144,000	1,622,000=1,747,000	+ 397,000
	19	1,907,000	1,708,000=1,833,000	+ 74,000
	20	2,054,000	1,791,000=1,916,000	+ 138,000
	21	2,109,000	1,812,000=1,937,000	+ 172,000
	22	2,095,000	1,884,000=2,009,000	+ 86,000
	23	1,918,000	1,907,000=2,032,000	(-114,000)
	24	1,835,000	1,987,000=2,162,000	(-274,000)
	25	1,635,000	2,075,000=2,200,000	(-565,000)
	26	1,806,000	2,259,000=2,384,000	(-578,000)
5.6" RAIN	27	1,809,000	1,953,000=2,078,000	(-269,000)
0.3" RAIN	28	1,784,000	1,480,000=1,605,000	+ 179,000
	29	1,594,000	1,612,000=1,737,000	(-143,000)
	30	1,583,000	1,633,000=1,758,000	(-175,000)
	31			

MONTH JULY – 1989

	DATE	TO HAMMOND	FROM GARY-HOBART (+-125,000-WELL (PACKAGEING))	INFILTRATION
	1	1,610,000	1,960,000-2,085,000	(-475,00
	2	1,477,000	2,210,000-2,335,000	(-858,00
	3	1,340,000	1,936,000-2,061,000	(-721,00
	4	1,206,000	2,033,000-2,158,000	(-952,00
	5	878,000	2,150,000-2,275,000	(-1,397,000)
	6	1,255,000	2,300,000-2,425,000	(-1,170,000)
	7	1,196,000	2,393,000-2,518,000	(-1,322,000)
	8	1,264,000	2,488,000-2,613,000	(-1,349,000)
	9	1,255,000	2,750,000-2,875,000	(-1,620,000)
	10	1,007,000	2,727,000-2,852,000	(-1,845,000)
	11	1,225,000	2,765,000-2,890,000	(-1,665,000)
0.8" RAIN	12	1,508,000	2,150,000-2,275,000	(-767,000)
	13	1,415,000	1,509,000-1,634,000	(-219,000)
	14	1,353,000	1,742,000-1,837,000	(-484,000)
	15	1,033,000	1,878,000-2,003,000	(-970,000)
	16	1,289,000	1,985,000-2,110,000	(-821,000)
	17	1,220,000	2,462,000-2,587,000	(1,367,000)
	18	1,363,000	2,246,000-2,371,000	(1,008,000)
3.1"-RAIN	19	2,397,000	1,660,000-1,785,000	+612,000
0.6"-RAIN	20	2,360,000	1,448,000-1,573,000	+787,000
1.2"-RAIN	21	3,434,000	1,460,000-1,585,000	+1,849,000
0.2"-RAIN	22	2,782,000	1,459,000-1,584,000	+1,198,000
	23	2,137,000	1,587,000-1,712,000	+425,000
	24	1,933,000	1,709,000-1,834,000	+99,000
0.1"-RAIN	25	1,931,000	1,860,000-1,985,000	(-54,000)
	26	1,864,000	1,737,000-1,862,000	+2,000
	27	1,626,000	1,748,000-1,873,000	(-247,000)
	28	1,600,000	1,822,000-1,947,000	(-347,000)
	29	1,645,000	1,813,000-1,938,000	(-293,000)
1.0"-RAIN	30	1,892,000	1,816,000-1,941,000	(-49,000)
	31	1,657,000	1,604,000-1,729,000	(-72,000)

MONTH AUGUST - 1989

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRATION
	1	1,627,000	1,680,000-1,805,000	(-178,000)
	2	1,538,000	1,739,000-1,864,000	(-326,000)
	3	1,382,000	1,841,000-1,966,000	(-584,000)
	4	1,415,000	1,921,000-2,046,000	(-631,000)
4" RAIN	5	1,422,000	1,922,000-2,047,000	(-625,000)
	6	1,356,000	1,607,000-1,732,000	(-376,000)
	7	1,250,000	1,680,000-1,805,000	(-555,000)
	8	1,152,000	1,650,000-1,775,000	(-623,000)
"RAIN	9	1,289,000	1,732,000-1,857,000	(-568,000)
"RAIN	10	1,456,000	1,554,000-1,679,000	(-223,000)
	11	1,222,000	1,514,000-1,639,000	(-417,000)
	12	1,596,000	1,620,000-1,745,000	(-149,000)
	13	1,467,000	1,619,000-1,744,000	(-277,000)
	14	1,153,000	1,931,000-2,056,000	(-903,000)
5" RAIN	15	1,647,000	1,563,000-1,688,000	(-41,000)
" RAIN	16	1,425,000	1,480,000-1,605,000	(-180,000)
	17	1,252,000	1,531,000-1,656,000	(-404,000)
	18	1,294,000	1,570,000-1,695,000	(-401,000)
	19	1,260,000	1,598,000-1,723,000	(-463,000)
5" RAIN	20	1,361,000	1,697,000-1,822,000	(-461,000)
	21	1,258,000	1,612,000-1,737,000	(-479,000)
	22	1,390,000	1,610,000-1,735,000	(-345,000)
7" RAIN	23	1,531,000	1,527,000-1,652,000	(-121,000)
2" RAIN	24	1,341,000	1,491,000-1,616,000	(-275,000)
	25	1,309,000	1,472,000-1,597,000	(-288,000)
	26	1,291,000	1,541,000-1,666,000	(-375,000)
	27	1,364,000	1,600,000-1,725,000	(-361,000)
	28	1,374,000	1,895,000-2,020,000	(-646,000)
0.2" RAIN	29	1,406,000	1,610,000-1,735,000	(-329,000)
0.1" RAIN	30	1,372,000	1,655,000-1,780,000	(-408,000)
	31	1,249,000	1,589,000-1,714,000	(-465,000)

MONTH SEPT. 89

	DATE	TO HAMMOND	FROM GARY-HOBART (+-125,000-WELL (PACKAGEING))	INFILTRATION
3.1"-RAIN	1	1,635,000	1,444,000-1,569,000	+66,000
0.1"-RAIN	2	3,024,000	1,348,000-1,473,000	+1,551,000
	3	2,078,000	1,654,000-1,779,000	+ 299,000
	4	1,506,000	1,368,000-1,493,000	+ 13,000
	5	1,359,000	1,575,000-1,700,000	(-341,000)
0.2"-RAIN	6	1,476,000	1,533,000-1,658,000	(-182,000)
[illegible]-RAIN	7	2,307,000	1,524,000-1,649,000	+ 658,000
0.2"-RAIN	8	2,185,000	1,410,000-1,535,000	+ 650,000
0.1"-RAIN	9	2,180,000	1,392,000-1,517,000	+ 663,000
0.2"-RAIN	10	2,570,000	1,411,000-1,536,000	+ 1,034,000
	11	2,009,000	1,600,000-1,725,000	+ 284,000
	12	1,758,000	1,509,000-1,634,000	+ 124,000
0.7"-RAIN	13	1,948,000	1,381,000-1,506,000	+ 442,000
0.7"-RAIN	14	2,582,000	1,380,000-1,505,000	+1,077,000
0.1"-RAIN	15	2,405,000	1,420,000-1,545,000	+ 860,000
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MONTH SEPT. 89

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
3.1"-RAIN	1	1,635,000	1,444,000-1,569,000	+ 66,00
0.1"-RAIN	2	3,024,000	1,348,000-1,473,000	+ 1,551,0
	3	2,078,000	1,654,000-1,779,000	+ 299,0
	4	1,506,000	1,368,000-1,493,000	+ 13,0
	5	1,359,000	1,575,000-1,700,000	(-341,0
0.2"-RAIN	6	1,476,000	1,533,000-1,658,000	(- [illegible]
1.0"-RAIN	7	2,307,000	1,534,000-1,649,000	+ 658,0
0.2"-RAIN	8	2,185,000	1,410,000-1,535,000	+ 650,0
0.6"-RAIN	9	2,180,000	1,392,000-1,517,000	+ [illegible]
0.2"-RAIN	10	2,570,000	1,411,000-1,536,000	+ 1,0[illegible]
	11	2,009,000	1,600,000-1,725,000	+ 284,0
	12	1,758,000	1,509,000-1,634,000	+ 124,0
0.7"-RAIN	13	1,948,000	1,381,000-1,506,000	+ 442,0
0.7"-RAIN	14	2,582,000	1,380,000-1,505,000	+1,077,0
0.1"-RAIN	15	2,405,000	1,420,000-1,545,000	+ 860,0
	16	2,213,000	1,380,000-1,505,000	+ 708,0
	17	1,907,000	1,454,000-1,579,000	+ 328,0
	18	1,902,000	1,660,000-1,785,000	+ 117,0
	19	1,758,000	1,490,000-1,615,000	+ 143,00
	20	1,592,000	1,487,000-1,612,000	(-20,0
	21	1,593,000	1,510,000-1,635,000	(- 42,0
	22	1,533,000	1,515,000-1,640,000	(-107,0
	23	1,441,000	1,318,000-1,443,000	(- 2,00
	24	1,578,000	1,516,000-1,641,000	(- 63,00
	25	1,487,000	1,618,000-1,743,000	(-256,0
	26	1,301,000	1,540,000-1,665,000	(-364,00
	27	778,000	1,564,000-1,689,000	(-911,00
	28	708,000	1,515,000-1,640,000	(-932,00
	29	646,000	1,564,000-1,689,000	(-1,043,0
	30	1,274,000	1,454,000-1,579,000	(-305,0
	31			

MONTH OCT. - 89

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	1,295,000	1,688,000-1,813,000	(-518,
	2	1,318,000	1,711,000-1,836,000	(-518,
	3	1,340,000	1,583,000-1,708,000	(-3[illegible]
	4	1,200,000	1,535,000-1,660,000	(-4[illegible]
	5	1,257,000	1,497,000-1,622,000	(-365,
0.3" RAIN	6	1,300,000	1,380,000-1,505,000	(-205,
	7	1,251,000	1,395,000-1,520,000	(-269,
	8	1,252,000	1,621,000-1,746,000	(-[illegible]
	9	1,248,000	1,558,000-1,683,000	(-[illegible]
"T"-RAIN	10	1,306,000	1,511,000-1,636,000	(-35[illegible]
	11	1,141,000	1,400,000-1,525,000	(-384,
	12	1,147,000	1,500,000-1,625,000	(-47[illegible]
	13	1,127,000	1,510,000-1,635,000	(-508,
	14	1,116,000	1,450,000-1,575,000	(-459,
	15	1,111,000	1,479,000-1,604,000	(-493,
	16	1,201,000	1,666,000-1,791,000	(-590,
0.8"-RAIN	17	1,240,000	1,442,000-1,567,000	(-327,
0.2"-RAIN	18	1,304,000	1,390,000-1,515,000	(-211,
0.1"-RAIN	19	1,147,000	1,488,000-1,613,000	(-466,
1.8" {RAIN SNOW	20	1,620,000	1,395,000-1,520,000	+100,
0.3"-RAIN	21	1,667,000	1,398,000-1,523,000	+144,
	22	1,542,000	1,401,000-1,526,000	+ 16,
	23	1,460,000	1,486,000-1,611,000	(-151,
	24	1,457,000	1,471,000-1,596,000	(-139,
	25	1,422,000	1,412,000-1,537,000	(-115,
	26	1,382,000	1,506,000-1,633,000	(-251,
	27	1,361,000	1,414,000-1,539,000	(-178,
	28	1,330,000	1,379,000-1,504,000	(-174,
	29	1,349,000	1,492,000-1,617,000	(-268,
	30	1,321,000	1,548,000-1,673,000	(-352,
	31	1,372,000	1,628,000-1,753,000	(-381,

MONTH NOV. 1989

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	1,251,000	1,313,000-1,438,000	(-1[illegible]
	2	1,274,000	1,437,000-1,562,000	(-2[illegible]
	3	1,201,000	1,466,000-1,591,000	(-3[illegible]
	4	1,173,000	1,379,000-1,504,000	(-331, 0
	5	1,199,000	1,363,000-1,488,000	(-289, 0
0.1" RAIN	6	1,283,000	1,584,000-1,709,000	(-426,
0.05" RAIN	7	1,294,000	1,415,000-1,540,000	(-246, 0
	8	1,250,000	1,426,000-1,551,000	(-301, 0
	9	1,180,000	1,451,000-1,576,000	(-396,
0.1"-RAIN	10	1,131,000	1,339,000-1,464,000	(-33[illegible]
0.05"-RAIN	11	1,122,000	1,356,000-1,481,000	(-359,
	12	1,149,000	1,440,000-1,565,000	(-416,
	13	1,159,000	1,537,000-1,662,000	(-503,
	14	1,130,000	1,464,000-1,589,000	(-459,
1.4" RAIN	15	1,576,000	1,380,000-1,505,000	+ [illegible]
1.5" RAIN	16	2,906,000	1,364,000-1,489,000	+ 1,41[illegible]
	17	2,382,000	1,400,000-1,525,000	+857, 0
	18	1,953,000	1,321,000-1,446,000	+507, 0
	19	1,820,000	1,421,000-1,546,000	+274, 0
	20	1,957,000	1,629,000-1,754,000	+203,
	21	1,799,000	1,403,000-1,528,000	+271, 0
	22	1,737,000	1,445,000-1,570,000	+167, 0
8.0"-SNOW	23	1,696,000	1,346,000-1,471,000	+225, 0
	24	1,417,000	1,468,000-1,593,000	(-[illegible]
	25	1,636,000	1,423,000-1,548,000	+ 88, 0
	26	1,821,000	1,401,000-1,526,000	+295,
	27	1,861,000	1,512,000-1,637,000	+224, 0
0.2"-RAIN	28	1,900,000	1,350,000-1,475,000	+425, 0
	29	1,814,000	1,361,000-1,486,000	+328, 0
	30	1,683,000	1,300,000-1,425,000	+258, 0
	31			

MONTH DEC. - 1989

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	1,642,000	1,566,000-1,691,000	- [illegible]
	2	1,640,000	1,456,000-1,581,000	+ 59,[illegible]
	3	1,576,000	1,310,000-1,435,000	+ 141,[illegible]
	4	1,626,000	1,536,000-1,661,000	- 35,[illegible]
	5	1,655,000	1,446,000-1,571,000	+ 84,[illegible]
	6	1,593,000	1,359,000-1,484,000	+ 109,[illegible]
	7	1,488,000	1,385,000-1,510,000	- 22,[illegible]
1.0"-SNOW	8	1,469,000	1,460,000-1,585,000	- 116,0[illegible]
	9	1,595,000	1,357,000-1,482,000	+ 113,[illegible]
	10	1,461,000	1,379,000-1,504,000	- 45,[illegible]
4.0" SNOW	11	1,457,000	1,512,000-1,637,000	- 180,[illegible]
	12	1,427,000	1,400,000-1,525,000	- 98,[illegible]
	13	1,306,000	1,393,000-1,518,000	-212,[illegible]
1.75" SNOW	14	1,344,000	1,415,000-1,540,000	-196,[illegible]
	15	1,329,000	1,498,000-1,623,000	-294,[illegible]
	16	1,222,000	1,315,000-1,440,000	-218,[illegible]
	17	1,212,000	1,432,000-1,557,000	-345,[illegible]
	18	1,281,000	1,582,000-1,707,000	-426,[illegible]
2.0" SNOW	19	1,292,000	1,398,000-1,523,000	-231,[illegible]
1.0" SNOW	20	1,242,000	1,478,000-1,603,000	-361,[illegible]
1.0" SNOW	21	1,213,000	1,403,000-1,528,000	-315,[illegible]
	22	1,161,000	1,426,000-1,551,000	-390,[illegible]
	23	1,144,000	1,460,000-1,585,000	-441,[illegible]
	24	1,261,000	1,538,000-1,663,000	-402,[illegible]
	25	1,151,000	1,450,000-1,575,000	-424,[illegible]
1.0" SNOW	26	1,022,000	1,448,000-1,573,000	-551,[illegible]
0.5" SNOW	27	1,115,000	1,500,000-1,625,000	-510,[illegible]
	28	1,193,000	1,543,000-1,668,000	-475,[illegible]
	29	835,000	1,436,000-1,561,000	-726,[illegible]
0.1"-RAIN	30	1,259,000	1,421,000-1,546,000	-287,[illegible]
	31	1,295,000	1,450,000-1,575,000	-280,[illegible]

MONTH JAN-1990

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	1,316,000	1,500,000-1,625,000	- 309,00
	2	1,168,000	1,460,000-1,585,000	- 417,00
	3	1,242,000	1,519,000-1,644,000	- 402,00
0.55" RAIN	4	1,628,000	1,423,000-1,548,000	+ 80,0
0.2" RAIN	5	1,912,000	1,435,000-1,560,000	+ 352,00
	6	1,720,000	1,449,000-1,574,000	+ 146,0
	7	1,686,000	1,441,000-1,566,000	+ 120,0
	8	1,629,000	1,600,000-1,725,000	- 96,00
	9	1,717,000	1,373,000-1,498,000	+ 219,0
0.2" RAIN	10	1,707,000	1,540,000-1,665,000	+ 42,0
	11	1,771,000	1,470,000-1,595,000	+ 176,00
	12	1,629,000	1,445,000-1,570,000	+ 59,00
	13	1,519,000	1,387,000-1,512,000	+ 7,00
	14	1,584,000	1,414,000-1,539,000	+ 45,00
	15	1,597,000	1,651,000-1,776,000	- 179,00
	16	1,559,000	1,458,000-1,583,000	- 24,00
0.9" RAIN	17	1,743,000	1,440,000-1,565,000	+ 178,00
0.15" RAIN	18	2,202,000	1,407,000-1,532,000	+ 670,00
	19	2,042,000	1,426,000-1,551,000	+ 491,00
0.1" RAIN	20	1,799,000	1,420,000-1,545,000	+ 254,00
0.2" RAIN	21	1,791,000	1,344,000-1,469,000	+ 322,000
0.1" RAIN	22	1,985,000	1,587,000-1,712,000	+ 273,00
	23	1,935,000	1,505,000-1,630,000	+ 305,00
	24	1,719,000	1,434,000-1,559,000	+ 160,00
1.1" RAIN	25	2,063,000	1,404,000-1,529,000	+ 534,00
0.3"-RAIN 0.5"-SNOW	26	3,378,000	1,440,000-1,565,000	+ 1,813,00
	27	1,938,000	1,397,000-1,522,000	+ 416,00
	28	2,456,000	1,380,000-1,505,000	+ 951,00
	29	2,228,000	1,600,000-1,725,000	+ 503,00
	30	2,140,000	1,428,000-1,553,000	+ 587,00
	31	2,034,000	1,474,000-1,599,000	+ 435,000

MONTH FEB. 1990

	DATE	TO HAMMOND	FROM GARY-HOBART (+-125,000-WELL (PACKAGEING))	INFILTRA
0.2" RAIN	1	1,959,000	1,372,000 = 1,497,000	+ 462,0
0.6" RAIN	2	2,541,000	1,473,000 = 1,598,000	+ 943,0
	3	2,639,000	1,375,000 = 1,500,000	+ 1,139,0
0.2" RAIN	4	2,408,000	1,374,000 = 1,499,000	+ 909,0
	5	2,235,000	1,536,000 = 1,661,000	+ 574,0
	6	2,119,000	1,322,000 = 1,447,000	+ 672,0
	7	2,101,000	1,434,000 = 1,559,000	+ 542,0
	8	2,101,000	1,414,000 = 1,539,000	+ 562,0
	9	2,053,000	1,401,000 = 1,526,000	+ 527,0
	10	1,887,000	1,378,000 = 1,503,000	+ 384,0
	11	1,747,000	1,320,000 = 1,445,000	+ 302,00
	12	1,727,000	1,527,000 = 1,652,000	+ 75,00
	13	1,740,000	1,450,000 = 1,575,000	+ 165,00
FREEZING RAIN 0.05"	14	1,607,000	1,483,000 = 1,608,000	+ 1,00
FREEZING RAIN & SNOW 5.5"	15	1,648,000	1,380,000 = 1,505,000	+ 143,00
0.15" FREEZING RAIN	16	1,644,000	1,353,000 = 1,508,000	+ 151,00
0.2" RAIN 0.3" SNOW	17	1,719,000	1,324,000 - 1,449,000	+ 270,00
	18	1,831,000	1,426,000 - 1,551,000	+ 280,00
	19	1,989,000	1,502,000 - 1,627,000	+ 362,00
	20	2,101,000	1,501,000 - 1,626,000	+ 475,00
	21	2,048,000	1,384,000 - 1,509,000	+ 539,00
0.7" - RAIN	22	2,332,000	1,316,000 - 1,491,000	+ 841,00
1.0" - RAIN 5.0" - SNOW	23	3,399,000	1,319,000 - 1,444,000	+ 1,955,00
2.0" - SNOW	24	3,787,000	1,350,000 - 1,475,000	+ 2,312,00
1.1" - SNOW	25	3,568,000	1,460,000 - 1,585,000	+ 1,983,000
	26	3,503,000	1,511,000 - 1,636,000	+ 1,867,000
	27	3,339,000	1,522,000 - 1,647,000	+ 1,692,000
	28	3,024,000	1,391,000 - 1,516,000	+ 1,508,00
	29			
	30			
	31			

MONTH - MARCH - 1990

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	3,041,000	1,449,000-1,574,000	+ 1,467.0
	2	2,962,000	1,482,000-1,607,000	+ 1,355.0
	3	2,865,000	1,350,000-1,475,000	+ 1,390.0
	4	2,721,000	1,516,000-1,641,000	+ 1,080.0
	5	2,580,000	1,562,000-1,687,000	+ 893.0
0.5" RAIN & SNOW	6	2,692,000	1,470,000-1,595,000	+ 1,097.0
	7	2,567,000	1,453,000-1,578,000	+ 989.0
"T" RAIN	8	2,326,000	1,383,000-1,508,000	+ 818.0
1.0" RAIN	9	2,941,000	1,337,000-1,462,000	+ 1,479.0
0.25"-RAIN	10	3,223,000	1,390,000-1,515,000	+ 1,708.0
0.6" RAIN	11	3,201,000	1,494,000-1,619,000	+ 1,582.0
0.1" RAIN	12	3,207,000	1,564,000-1,689,000	+ 1,518.0
	13	3,118,000	1,580,000-1,705,000	+ 1,413.0
	14	3,043,000	1,370,000-1,495,000	+ 1,548.0
	15	3,036,000	1,475,000-1,600,000	+ 1,436.0
	16	2,761,000	1,380,000-1,505,000	+ 1,256.0
	17	2,499,000	1,441,000-1,566,000	+ 993.0
	18	2,257,000	1,375,000-1,500,000	+ 757.0
0.2" RAIN & SNOW	19	2,180,000	1,548,000-1,673,000	+ 507.0
	20	2,174,000	1,432,000-1,557,000	+ 617.0
	21	2,043,000	1,461,000-1,586,000	+ 457.0
0.1" RAIN	22	2,100,000	1,395,000-1,520,000	+ 580.0
1.0" RAIN	23	3,175,000	1,464,000-1,589,000	+ 1,586.0
	24	2,737,000	1,360,000-1,485,000	+ 1,252.0
	25	2,551,000	1,496,000-1,621,000	+ 930.0
	26	2,491,000	1,596,000-1,721,000	+ 770.0
	27	2,208,000	1,342,000-1,467,000	+ 741.0
	28	2,164,000	1,462,000-1,587,000	+ 577.0
0.3" RAIN	29	2,105,000	1,410,000-1,535,000	+ 570.0
0.5" RAIN	30	2,528,000	1,350,000-1,475,000	+ 1,053.0
0.1" RAIN	31	2,518,000	1,427,000-1,552,000	+ 966.0

MONTH APRIL - 1990

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
0.2" RAIN	1	2,407,000	1,406,000-1,531,000	+ 876,0
0.4" RAIN	2	2,533,000	1,504,000-1,629,000	+ 904,0
0.1" RAIN	3	2,560,000	1,591,000-1,716,000	+ 844,0
0.15" RAIN	4	2,387,000	1,452,000-1,577,000	+ 810,0
	5	2,496,000	1,397,000-1,522,000	+ 974,0
	6	2,260,000	1,440,000-1,565,000	+ 695,0
	7	2,071,000	1,393,000-1,518,000	+ 553,0
	8	1,991,000	1,532,000-1,657,000	+ 334,0
	9	1,872,000	1,483,000-1,608,000	+ 264,0
0.6" RAIN	10	2,028,000	1,440,000-1,565,000	+ 463,0
0.2" RAIN	11	2,249,000	1,404,000-1,529,000	+ 720,0
0.4" RAIN	12	2,281,000	1,406,000-1,531,000	+ 750,0
	13	2,250,000	1,452,000-1,577,000	+ 673,0
0.8" RAIN	14	2,445,000	1,373,000-1,498,000	+ 947,0
0.1" RAIN	15	2,820,000	1,511,000-1,636,000	+ 1,184,0
	16	2,174,000	1,335,000-1,460,000	+ 714,0
0.2" RAIN	17	2,488,000	1,532,000-1,657,000	+ 831,0
	18	2,304,000	1,502,000-1,627,000	+ 677,0
	19	2,202,000	1,531,000-1,656,000	+ 546,0
0.1" RAIN	20	2,030,000	1,412,000-1,537,000	+ 493,0
1.4" RAIN	21	2,659,000	1,318,000-1,493,000	+ 1,166,0
	22	2,975,000	1,493,000-1,618,000	+ 1,357,0
	23	2,991,000	1,750,000-1,875,000	+ 1,116,0
	24	2,680,000	1,557,000-1,682,000	+ 998,0
	25	2,520,000	1,592,000-1,717,000	+ 803,0
	26	2,447,000	1,674,000-1,799,000	+ 648,0
	27	2,280,000	1,639,000-1,764,000	+ 516,0
	28	2,215,000	1,570,000-1,695,000	+ 520,0
	29	2,040,000	1,501,000-1,626,000	+ 414,0
	30	1,910,000	1,773,000-1,898,000	+ 12,0
	31			

MONTH - MAY - 1990

+-125,000 - WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	1,845,000	1,546,000-1,671,000	+174,000
	2	1,682,000	1,493,000-1,618,000	+ 64,000
	3	1,682,000	1,682,000-1,727,000	(-45,000
1.5"-RAIN	4	1,850,000	1,560,000-1,685,000	+165,000
0.4"-RAIN	5	3,120,000	1,457,000-1,582,000	+1,538,000
	6	2,291,000	1,510,000-1,635,000	+656,000
	7	2,252,000	1,629,000-1,754,000	+498,000
	8	2,176,000	1,648,000-1,773,000	+403,000
	9	1,950,000	1,643,000-1,768,000	+182,000
2.5"-RAIN	10	2,722,000	1,570,000-1,695,000	+1,027,000
0.2"-RAIN	11	3,553,000	1,566,000-1,691,000	+1,862,000
0.7"-RAIN	12	3,725,000	1,511,000-1,636,000	+2,089,000
1.5"-RAIN	13	3,310,000	1,546,000-1,671,000	+1,639,000
	14	3,683,000	1,641,000-1,766,000	+1,917,000
0.1"-RAIN	15	3,644,000	1,593,000-1,718,000	+1,926,000
0.4"-RAIN	16	3,543,000	1,540,000-1,665,000	+1,878,000
0.5"-RAIN	17	3,551,000	1,641,000-1,766,000	+1,785,000
	18	3,499,000	1,625,000-1,750,000	+1,749,000
	19	3,375,000	1,612,000-1,737,000	+1,638,000
0.5"-RAIN	20	3,051,000	1,466,000-1,591,000	+1,460,000
	21	3,554,000	1,698,000-1,823,000	+1,731,000
	22	3,100,000	1,539,000-1,664,000	+1,436,000
	23	2,732,000	1,337,000-1,462,000	+1,270,000
	24	2,632,000	1,805,000-1,930,000	+ 702,000
0.1"-RAIN	25	2,540,000	1,586,000-1,711,000	+ 829,000
1.2"-RAIN	26	3,140,000	1,387,000-1,512,000	+1,628,000
	27	3,434,000	1,513,000-1,638,000	+1,796,000
	28	2,740,000	1,533,000-1,658,000	+1,082,000
	29	2,471,000	1,767,000-1,892,000	+ 579,000
	30	2,554,000	1,640,000-1,765,000	+ 789,000
	31	2,400,000	1,741,000-1,866,000	+ 534,000

TOTAL RAIN FOR MONTH = 5.6"

MONTH JUNE - 1990

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	2,290,000	1,780,000-1,905,000	+385,0
	2	2,214,000	1,734,000-1,859,000	+355,0
	3	2,149,000	1,674,000-1,799,000	+350,0
	4	1,933,000	1,870,000-1,995,000	(-62,000
	5	1,772,000	1,761,000-1,886,000	(-114,00
0.1" RAIN	6	1,764,000	1,530,000-1,655,000	+109,00
	7	1,818,000	1,934,000-2,059,000	(-241,00
2.1" RAIN	8	2,180,000	1,808,000-1,933,000	+247,00
	9	3,153,000	1,672,000-1,797,000	+1,356,00
	10	2,430,000	1,802,000-1,927,000	+ 503,00
	11	2,043,000	1,924,000-2,049,000	(-6,000
	12	2,006,000	1,991,000-2,116,000	(-110,00
	13	1,934,000	2,090,000-2,215,000	(-281,000
0.8" RAIN	14	1,910,000	2,030,000-2,155,000	(-245,000
	15	1,957,000	1,684,000-1,809,000	+148,00
	16	1,622,000	1,606,000-1,731,000	(-109,000
0.3" RAIN	17	1,977,000	1,842,000-1,967,000	(-10,000
0.1" RAIN	18	1,666,000	1,864,000-1,989,000	(-323,000
	19	1,704,000	1,958,000-2,083,000	(-379,000
0.1" RAIN	20	1,690,000	1,782,000-1,907,000	(-217,000
	21	1,710,000	1,680,000-1,805,000	(-95,000
	22	1,624,000	1,734,000-1,859,000	(-235,000
0.5" RAIN	23	1,724,000	1,696,000-1,821,000	(-97,000
0.1" RAIN	24	1,655,000	1,585,000-1,710,000	(-55,000
	25	1,522,000	1,751,000-1,876,000	(-354,000
	26	1,505,000	1,867,000-1,992,000	(-487,000
0.2" RAIN	27	1,570,000	1,680,000-1,805,000	(-235,000
0.2" RAIN	28	1,563,000	1,795,000-1,920,000	(-357,000
1.0" RAIN	29	1,644,000	1,593,000-1,718,000	(-74,000
0.1" RAIN	30	1,912,000	1,602,000-1,727,000	+185,000
	31			

MONTH JULY - 1990

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRAT
0.15" RAIN	1	1,723,000	1,703,000-1,828,000	+105,000
	2	1,550,000	1,750,000-1,875,000	(-325,000
	3	1,587,000	1,923,000-2,048,000	(-461,000
	4	1,312,000	1,902,000-2,027,000	(-715,000
	5	1,057,000	2,226,000-2,351,000	(-1,294,000
	6	1,275,000	2,023,000-2,148,000	(-873,000
	7	1,183,000	2,007,000-2,132,000	(-949,000
	8	1,591,000	2,131,000-2,262,000	(-671,000
	9	1,296,000	2,761,000-2,886,000	(-1,590,000
0.7" RAIN	10	1,642,000	2,481,000-2,606,000	(-964,000
1.9" RAIN	11	1,880,000	1,505,000-1,630,000	+250,000
0.1" RAIN	12	2,346,000	1,566,000-1,685,000	+661,000
	13	1,687,000	1,555,000-1,680,000	+ 7,000
	14	1,612,000	1,549,000-1,674,000	-(-62,000)
0.2" RAIN	15	1,722,000	1,545,000-1,670,000	(-52,000)
0.1" RAIN	16	1,596,000	1,577,000-1,702,000	(-106,000)
0.1" RAIN	17	1,620,000	1,716,000-1,841,000	(-221,000)
	18	1,576,000	1,976,000-2,101,000	(-525,000
0.1" RAIN	19	1,452,000	1,820,000-1,945,000	(-493,000
2.5" RAIN	20	2,683,000	1,813,000-1,938,000	+745,000
0.6" RAIN	21	3,095,000	1,650,000-1,777,000	+1,318,000
0.6" RAIN	22	2,556,000	1,539,000-1,664,000	+886,000
0.9" RAIN	23	3,097,000	1,728,000-1,853,000	+1,244,000
	24	2,414,000	1,697,000-1,822,000	+542,000
	25	2,457,000	1,624,000-1,749,000	+708,000
0.6" RAIN	26	2,285,000	1,670,000-1,795,000	+490,000
	27	2,061,000	1,775,000-1,900,000	+161,000
	28	1,910,000	1,807,000-1,932,000	(-22,000)
0.2" RAIN	29	1,895,000	1,971,000-2,101,000	(-206,000)
0.25" RAIN	30	1,983,000	1,747,000-1,872,000	+111,000
	31	1,885,000	1,574,000-1,699,000	+186,000

APPENDIX N

Wetlands Investigation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

5HS-11

REPLY TO ATTENTION OF:

August 13, 1990

Kevin Domack
Warzyn Engineering Inc.
One Science Court
Madison, WI 53711

RE: Wetlands Delineation Report
American Chemical Services NPL Site
Griffith Indiana

Dear Mr. Domack:

Enclosed please find a copy of the report titled "Wetlands Delineation at American Chemical Services Hazardous Waste Site, Griffith, Indiana IAG DW14934313-0". If you have any questions concerning the content of the report, please contact me with your question and I will put you in touch with the Fish & Wildlife biologists. My telephone number is (312) 886-5116 if you need to contact me.

Sincerely,

Robert E. Swale
Remedial Project Manager

Printed on Recycled Paper

Wetlands Delineation at American Chemical Services Hazardous Waste Site, Griffith, Indiana. IAG-DW14934313-0

Robin A. Nims
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
718 North Walnut Street
Bloomington, Indiana

May 1990

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Summary

At the request of the U.S. Environmental Protection Agency, Region V, the U.S. Fish and Wildlife Service conducted a wetlands delineation for site wetlands potentially impacted by contaminants originating at the American Chemical Services (ACS) hazardous waste site.

Office review and field surveying indicated numerous wetlands exist at the ACS site, many of which are not identified on the National Wetland Inventory. The diversity of wetland types present provide habitat for a variety of wildlife species.

INTRODUCTION

The American Chemical Services (ACS) Superfund site is located in Griffith, Indiana on the outskirts of the city's southeast side. The site was placed on the National Priorities List in 1983 as a result of investigations into chemical disposal practices on the site. ACS operates as a chemical/solvent recovery facility, which also has a limited chemical manufacturing operation. During the course of its operations, ACS dumped and otherwise disposed of unrecoverable solvents on the property, in addition to transporting waste to the adjacent Griffith City Landfill. Kapica Drum, Inc. also allegedly disposed of drum-cleaning residues on ACS property. These 3 sites total 52 acres and jointly comprise the official ACS site.

The National Wetland Inventory (Figure 1) indicates numerous and extensive wetlands within a 1-mile radius of the ACS site to the southwest, south, southeast, east, and northeast. There is an extensive wetland complex adjacent to the northwest boundary of the site. These wetlands are dissected and bordered by the Grand Trunk Western Railroad lines, the Chesapeake and Ohio Railroad lines, and the abandoned Erie-Lackawanna Railroad lines. The wetlands to the north of the Grand Trunk Western lines were not within the project boundary limits, however, they are likely hydraulically connected. The NWI map classifies this wetland complex as palustrine, emergent, semi-permanent/palustrine emergent, seasonally flooded. The entire complex is approximately 78 acres, however, only 50.5 acres were included in the present delineation.

OBJECTIVES

The objectives of this project were:

1. To ground-truth and verify wetlands delineated on the National Wetland Inventory maps.

2. To identify other wetland areas not included in the National Wetland Inventory.

3. To identify dominant vegetation in the various wetland areas.

4. To assess relative value of the various wetland habitats for fish and wildlife resources.

METHODS

The methods utilized in this delineation are outlined in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989). Because of the relative homogeneity of the site, the soils assessment procedure was selected. Prior to the field work, an office review was conducted to preliminarily outline the area in question. Due to the unavailability of the most recent aerial photographs the preliminary boundaries were outlined from a 1984 photograph, obtained from the EPA project manager. Based upon the field inspection, the 1984 photograph was accurate with the exception of approximately 5 additional acres lost to the Griffith Landfill operation.

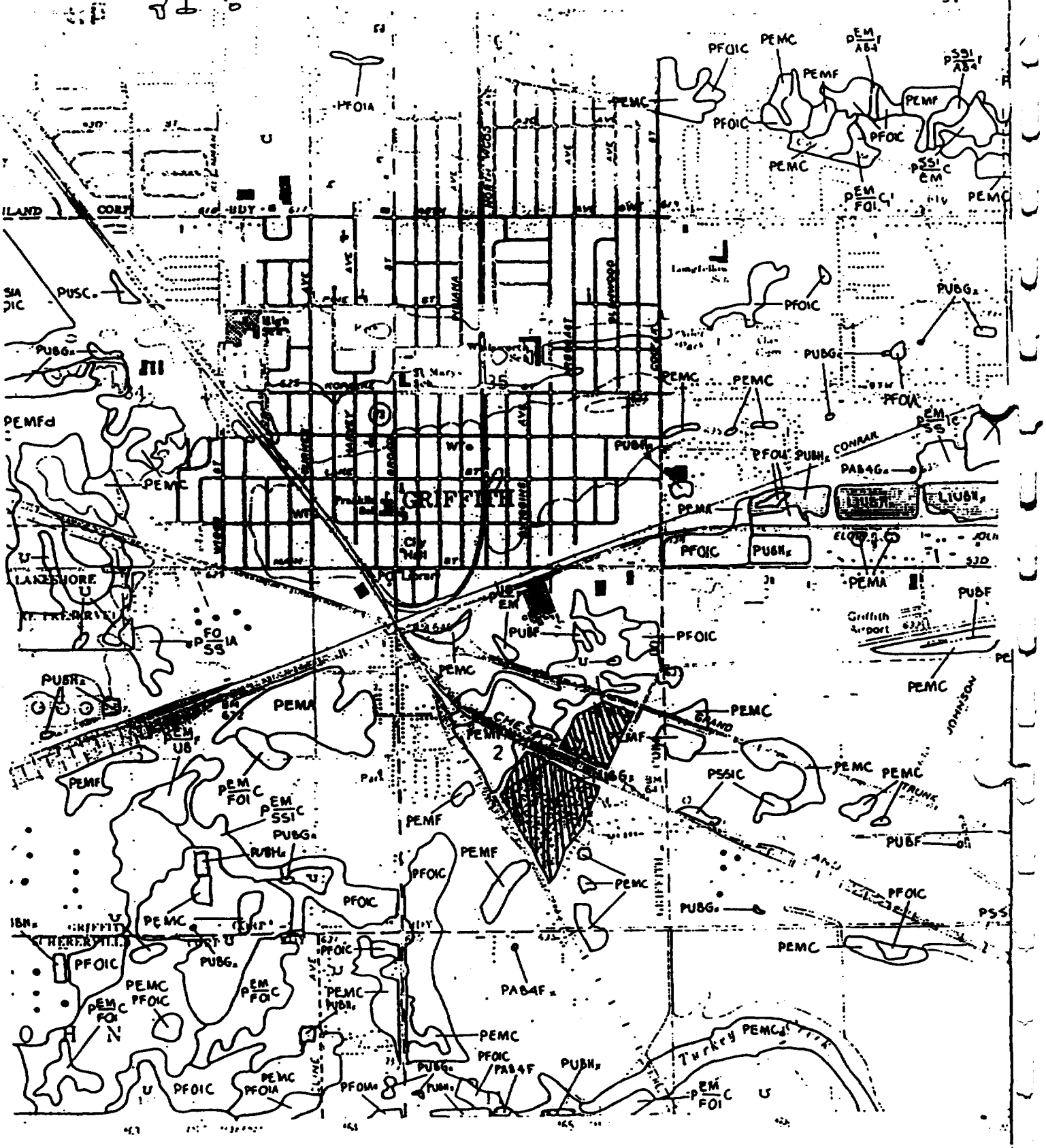


FIGURE 1. National Wetland Inventory map in the vicinity of the American Chemical Service site, Griffith, Indiana. USGS Highland Quadrangle. Cross-hatched area is ACS.

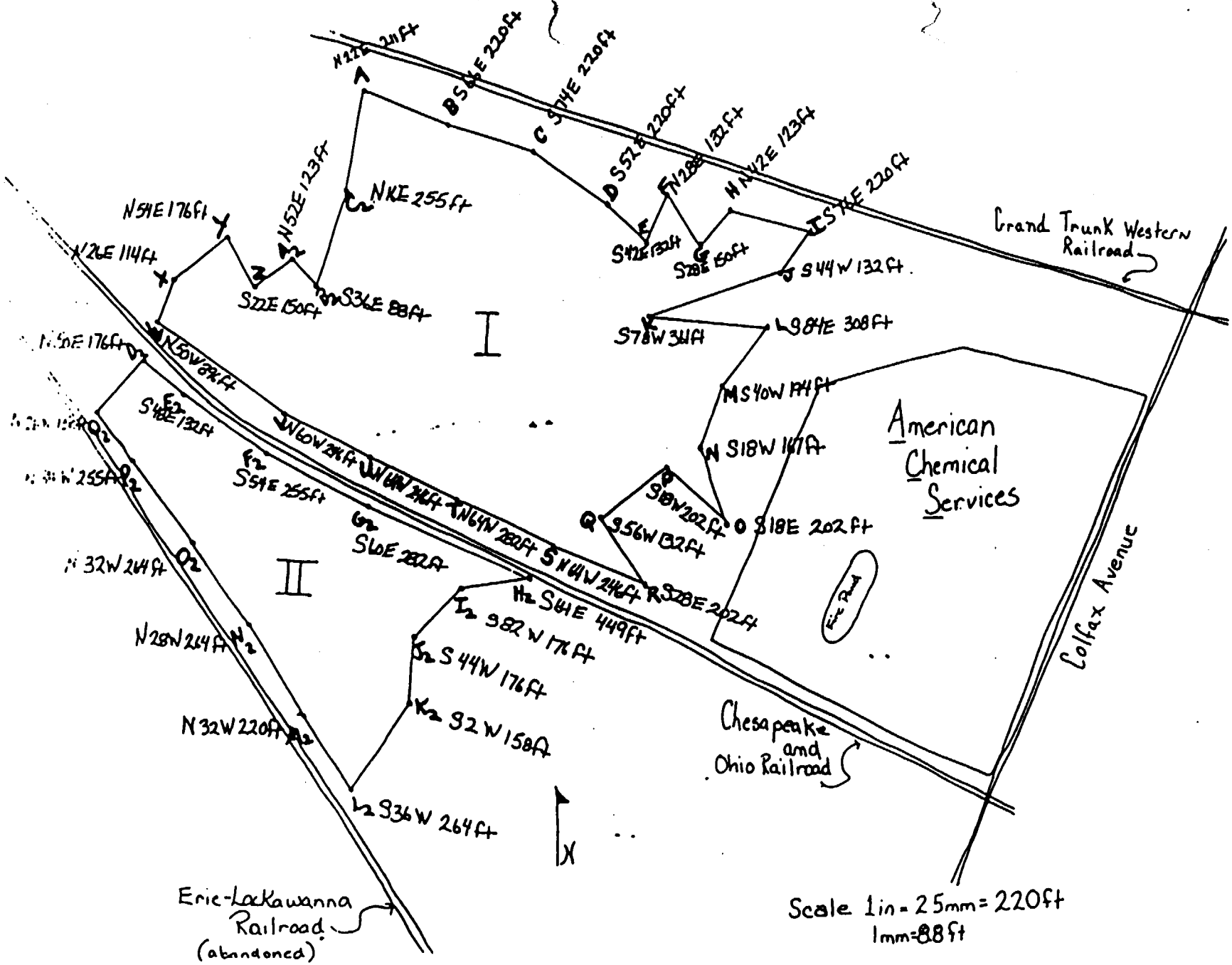
During the office review and map preparation a copy of the U.S. Soil Conservation Service Soil Survey for Lake County, Indiana (1972) was consulted to determine the presence or absence, and locations of hydric soils. The Lake County Indiana Survey sheet number 21 (Figure 2) indicates the majority of the area in question consists of Maumee loamy fine sand, interspersed with areas of Plainfield fine sand, Watseka loamy fine sand, and a small section of Tawas muck. The Maumee loamy fine sand and Tawas muck are classified by the U.S. Department of Agriculture and the Soil Conservation Service (1986) as hydric soils. The soil survey was used to compare soil types to the general configuration of the visual boundary of the wetlands on the aerial photograph. To avoid damaging the aerial photograph, a clear plastic overlay was attached and the information transcribed. Points along the visual perimeter of the wetland that coincided with the hydric soils boundaries were randomly selected and their compass bearings recorded to assist in field location. Location of the points were arbitrarily located from 88 to 282 feet apart based upon a scale of 1 inch (in) = 25 millimeters (mm) = 220 feet (ft), 1 mm = 8.8 ft. The preliminary map generated in the office (Figure 3) was used in the field reconnaissance flagging effort. In the field, point A was located on ground by its position relative to the railroad track embankment and the tree row in the upper northwest corner of the study area. Based upon the preliminary map, point B was located with the use of a Suunto MC-1 mirror compass and was measured off with a tape measure 220 feet S 66 E of point A. All other points were located and measured off in the same manner. Orange flags were placed at each point, and pink flags were placed every 55 feet to assist in maintaining the proper bearing alignment. During the flagging reconnaisance visit, no sign of disturbed conditions existed in the wetland areas with the exception of the railroad embankments that were placed through the wetlands, and minor disturbances such as small clearings for groundwater wells etc., resulting from other remedial investigation activities occuring at the site. An apparent illegal fill had occured in the wetland located adjacent to the Griffith City Landfill.

During the reconnaisance flagging visit it was noted that the entire wetland area identified on the National Wetland Inventory either possessed standing water (up to 2.5 feet in some areas; 5 feet in the ditches), or water-logged saturated soils (water table at soil surface). Based upon these field observations it was determined that the hydrologic criteria for wetlands was met.

To aid in the identification of the different soil types in the field, the soil profiles for Maumee loamy fine sand and Plainfield fine sand were recorded (Table 1). Because the soil sample probes were taken to a depth of 18 inches, only the first 3 incremented intervals were noted. Soil samples were collected at each point with a 21 inch Hoffer Soil Sampler probe. Due to extreme inclement weather, and the strikingly obvious difference between the hydric and non-hydric soils, the soil samples were observed in the field and the lowest 3 inches were collected in whirl-pak bags for later comparisons to the Munsell Soil Color charts. Areas possessing standing water did not yield soil samples due to wash-out upon extraction of the probe. In these instances the whirl-pak bag containing the point location tags were transported back to the office empty.

Representative observation areas (Figure 4) were selected based upon several factors. In addition to selecting areas that met the hydric soil criterion, representative observation areas that had apparent characteristics, but were not identified on the National Wetland Inventory map were also chosen. The plant communities were characterized, and the percent areal cover of the dominant species

FIGURE 2. U.S. Soil Conservation Survey-Lake County. Plate number 21. Cross-hatched area is ACS. Shaded areas are hydric soils.



3. Preliminary wetland boundaries transcribed from 1984 aerial photograph. (Reduced 64%)

Table 1. Typical, Profiles for Maumee loamy fine sand (Hydric) and Plainfield fine sand (Non-hydric) in Lake County, Indiana.

Maumee loamy fine sand			Plainfield fine sand		
Depth	Color	Munsell Notation	Depth	Color	Munsell Notation
0-9 inches	Black	N 2/0	0-4 inches	Dark Grey	10 YR. 3
9-16 inches	Black	N 2/0	4-6 inches	Greyish brown	10 YR. 4/2
16-21 inches	Black	N 2/0	6-27 inches	Yellowish brown	10 YR. 5/4

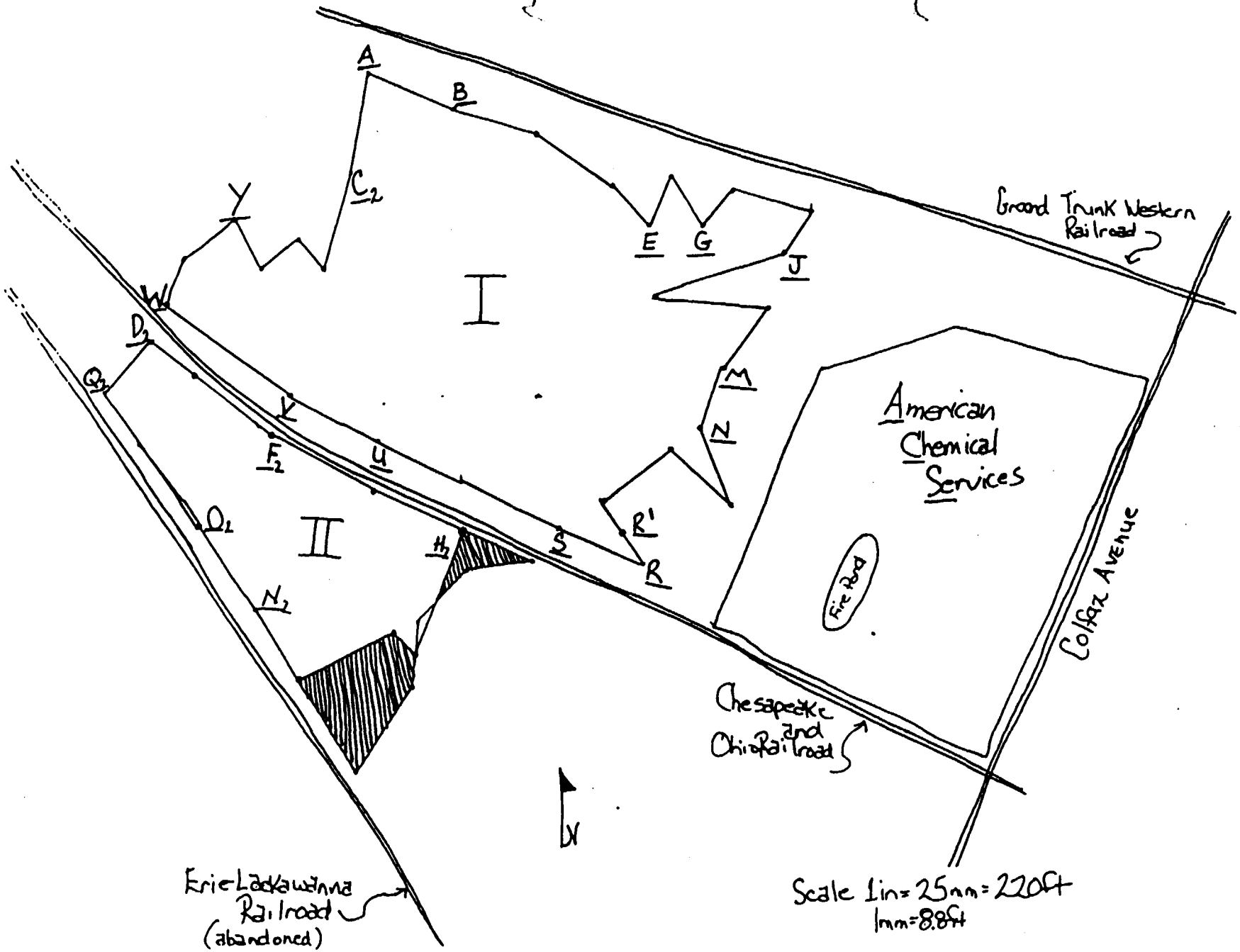


Fig. 4. Representative observation areas for vegetation sampling. Cross-hatched area lost to landfill expansion.

in the communities were visually estimated. Samples of the dominant vegetation at each of the representative areas were collected in 8 gallon plastic bags and transported to the office for later identification. A list of references used is included in Appendix 1. Once the vegetation was identified the information was recorded on field data forms and the indicator status of the species was obtained from the National List of Plant Species that occur in Wetlands; Indiana (1988). A wetland determination was then made for each representative observation area based upon the 3 mandatory technical criteria; hydrophytic vegetation, hydric soils, and wetland hydrology, as outlined in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands. The information obtained in the survey was used to prepare the final map of the site wetlands. It is important to note that no "additional" wetlands have been delineated in terms of acreage. This study has examined wetlands currently shown on the National Wetland Inventory map, and differentiated between the existing habitat types that are not delineated on the NWI within the original boundaries. The wetland boundaries indicated on Figures 5 and 6 were drawn based upon visual field observations of shifts in dominant vegetation. All soils within the peripheral boundaries are hydric.

RESULTS AND DISCUSSION

Of the 21 representative observation areas sampled, 12 met all 3 mandatory technical criteria for wetland determination (Table 2). Of the 9 areas that failed the mandatory technical criteria test, M, N, S, D_2, and H_2 lacked all 3 criteria; C_2 and Q_2 lacked hydrophytic vegetation criteria; R^1 lacked hydric soil and hydrology criteria, and F_2 lacked wetland hydrology and hydrophytic vegetation criterion.

Wetland I

Wetland I is bounded by the Grand Trunk Western Railroad, the American Chemical Services site, and the Chesapeake and Ohio Railroad. Based upon the results of the survey this area is more complex than the National Wetland Inventory (NWI) indicates (Figure 5). NWI shows this area as consisting of a large palustrine, emergent, semi-permanent mixed with seasonally flooded wetland. The NWI does not show any of the forested or scrub-shrub wetlands bordering the palustrine emergent area. Of the 15 representative observation areas selected for Wetland I, the 5 that did not meet the technical criteria for wetland determination were all transitional zones between the wetland-upland interface. Non-hydric soils were present at 4 of the 5 areas. All of the areas possessed hydrophytic vegetation, but the percentage of FACU and UPL exceeded the percentage of FACW and OBL species at each of the 5 areas except R^1. It should be noted that some species were collected at the various areas that did not have indicator category designations; these species were not located in either the state or national list of plant species found in wetlands. It is sophistic to automatically list species not included on the National Plant List as UPL species, however, based upon reviewers suggestions this has been done with the exception of 2 species of liverworts: *Riccia fluitans* and *Ricciocarpus natans.* These two species are bryophytes which are found *in* the water; it would be completely erroneous to list these as UPL species.

Wetland II

Wetland II is bounded by the Chesapeake and Ohio Railroad, the City of Griffith landfill, and the abandoned Erie-Lackawanna Railroad bed. Wetland II, according to the NWI is a palustrine, emergent, semi-permanent wetland. The various other habitat types surrounding it have been omitted from the official map.

This wetland area has been impacted due to past and present expansion of the City of Griffith Landfill. Approximately 5 acres of emergent/scrub-shrub/forested wetland on the north and southeast corners have been filled since the 1984 aerial photograph was taken. There is also a gravel road/turn-around that appeared to have been recently laid in the center of the palustrine, emergent, seasonally flooded wetland (Figure 5). This was probably an illegal fill; the U.S. Army Corps of Engineers has been notified.

There were 4 representative observation areas that did not meet the 3 technical criteria for wetland designation. However, 3 areas were placed along the railroad embankment, due to the location of a drainage ditch (approximately 5 feet deep) lying between the railroad tracks and the wetland area to the south of the ditch. Additional representative areas were not selected to replace areas not meeting the 3 mandatory criteria, any additional points along the railroad embankment would yield

Table 2. Results of the technical criteria test for 21 representative observation areas at the ACS site, Griffith, Indiana.

Area	Soil Series	Hydrophytic Vegetat	Hydric Soil		Wetland Hydrology		Wetland Determination	
		% OBL, FACW	Yes	No	Yes	No	Yes	No
A	Maumee loamy fine sand	71.0	X		X		X	
B	Maumee loamy fine sand	100.0	X		X		X	
E	Maumee loamy fine sand	66.7	X		X		X	
G	Maumee loamy fine sand	88.0	X		X		X	
J	Maumee loamy fine sand	100.0	X		X		X	
M	Plainfield fine sand	25.0		X		X		X
N	Plainfield fine sand	20.0		X		X		X
R[1]	Plainfield fine sand	50.0		X		X		X
R	Maumee loamy fine sand	66.0	X		X		X	
S	Plainfield fine sand	45.0		X		X		X
U	Maumee loamy fine sand	100.0	X		X		X	
V	Maumee loamy fine sand	100.0	X		X		X	
W	Maumee loamy fine sand	75.0	X		X		X	
Y	Maumee loamy fine sand	60.0	X		X		X	
C_2	Maumee loamy fine sand	16.0	X		X			X
D_2	Plainfield fine sand	14.0		X		X		X
F_2	Maumee loamy fine sand	40.0	X			X		X
H_2	Plainfield fine sand	25.0		X		X		X
N_2	Maumee loamy fine sand	100.0	X		X		X	
O_2	Maumee loamy fine sand	100.0	X		X		X	
Q_2	Maumee loamy fine sand	25.0	X		X			X

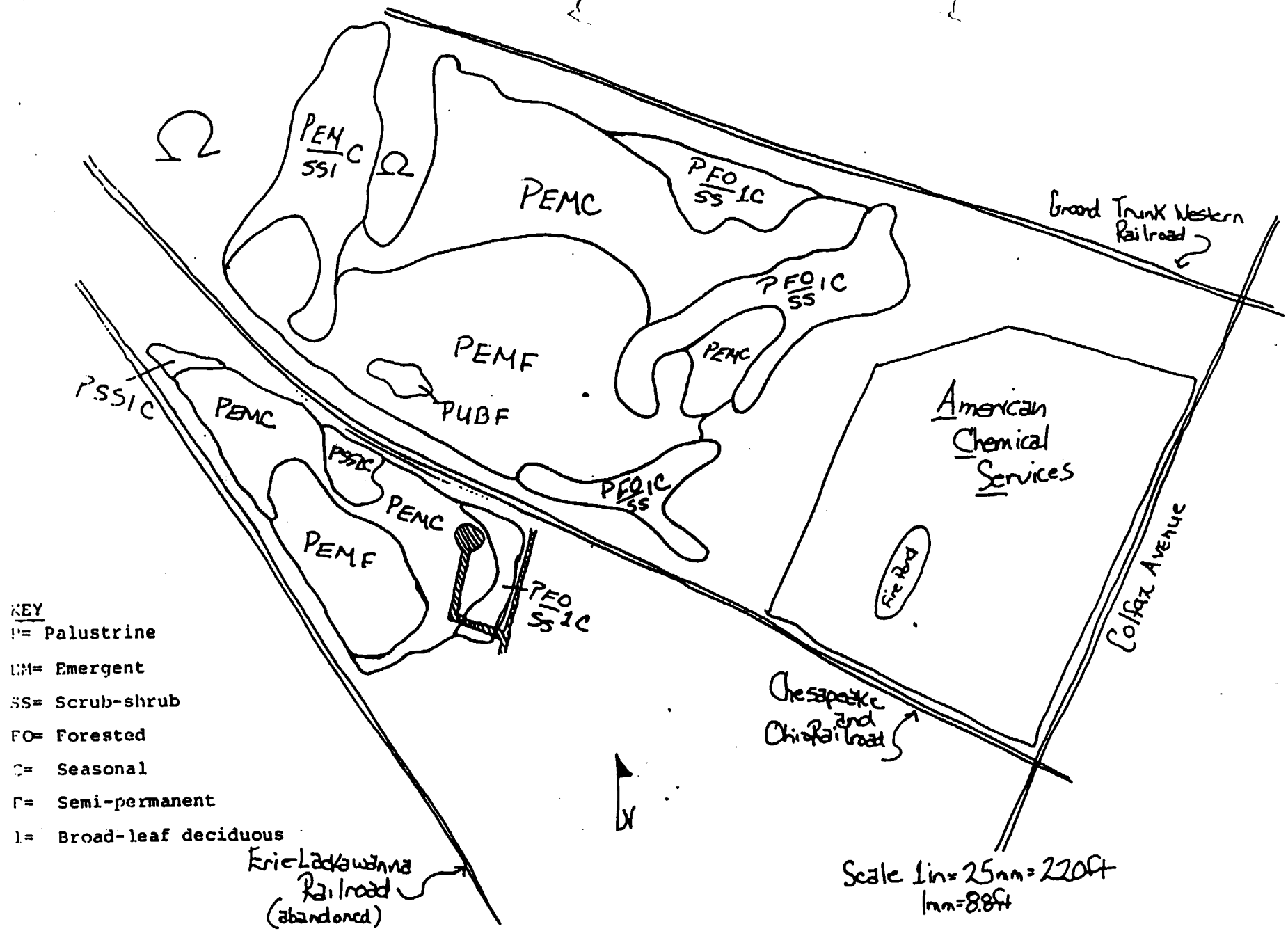


FIGURE 5. Wetland designations at the ACS site, Griffith, Indiana. Cross-hatched area is location of the illegal service road/turn-around fill.

the same results. Technically, the entire area would be classified wetlands if the railroad tracks and embankments did not exist. The 4th area lacked a predominance of hydrophytic vegetation.

NATURAL RESOURCES

This field investigation indicated that the natural resources and natural resource values of the wetland habitats are greater than originally suspected because of the diversity of habitat types present: emergent, scrub-shrub, and forested.

The vegetation of "marshes" is characterized by emergent aquatic plants growing in permanent to semi-permanent shallow water. Also present are species of shallow open water communities, as well as those found in sedge meadows and seasonally flooded basins. Marshes are among the most productive of all wetlands for waterbirds and furbearers, and can also provide spawning and nursery habitat for many species of fish. Birds that use marshes for breeding and feeding include ducks, geese, rails, herons, egrets, terns, and many songbirds. Raptors such as the osprey, bald eagle, and northern harrier frequent marshes in search of prey. Important furbearers inhabiting marshes include beaver, muskrat, and mink. Excellent winter habitat can be provided for upland wildlife, including ring-necked pheasant and eastern cottontail (Eggers and Reed 1987).

The emergent wetlands in the centers of wetland areas I and II are predominated by cattails. A list of species collected can be found in Table 3. Cattail stands provide important food and cover for wildlife. For example, the rhizomes are eaten by geese and muskrats. Muskrats also use the foliage to construct their lodges, which in turn can provide resting and nesting sites for waterbirds. Yellow-headed blackbirds, red-winged blackbirds, and marsh wrens build their nests in cattail vegetation. Wetland area I contains an open water area with a muskrat den and much activity in this area was apparent.

The transitional zones between the emergent areas and shrubby or forest areas support hydrophytic vegetation on saturated but not inundated soils. Plants occurring in these areas include species found in other communities, such as the annuals of seasonally flooded basins, emergent aquatics of marshes, and invading shrubs or trees, which are present as scattered, small individuals.

The transitional emergent zones are particularly important for their water quality functions. Wildlife habitat is provided for many species including sandhill crane, ring-necked pheasant, common snipe, sedge wren, small mammals, and white-tailed deer. The composites found in these areas are an important fall and winter food source for songbirds.

Scrub-shrub wetlands are plant communities dominated by woody vegetation less than 20 feet in height and with dbh's of less than 6 inches growing on saturated to seasonally flooded soils. They can be dominated by willows and/or red-osier, and sometimes silky (swamp) dogwood. These areas usually retain some of the forbs, grasses, and sedges of the transitional emergent zones. The vegetation in scrub-shrub wetlands possesses a variety of wildlife value. Willows are browsed by white-tail deer and eastern cottontails; red-osier dogwoods provide berries for song birds and ruffed grouse and are browsed by deer and rabbits; and elderberry also provides berries for songbirds and ruffed grouse.

Forested wetlands are dominated by mature conifers or lowland hardwood trees. They

Table 3. List of Vegetation Species collected on April 10-11, 1990 at the ACS site, Griffith, Indiana.

Scientific Name	Common Name	Indicator Category*
Agrimonia parviflora	Agrimony	FAC+
A. pubescens	Agrimony	UPL
Ampelopsis arborea	Peppervine	FACW
Apocyneum androsaemifolium	Spreading dogbane	UPL
Aronia arbutifolia	Red chokeberry	FACW
Betula allegheniensis	Yellow birch	FAC
[illegible]tha palustris	Marsh marigold	OBL
Celtis occidentalis	Hackberry	FAC-
Cornus ammonum	Swamp dogwood	FACW+
C. stolonifera	Red-osier dogwood	FACW
Corylus americana	Hazelnut	FACU
Cytisus scoparius	Scotch broom	UPL
Dipsacus sylvestris	Teasel	FAC
Fragaria virginiana	Common Strawberry	FAC-
Galium aparine	Bedstraw	FACU
Hamamelis virgiana	Witch hazel	FACU
Liquidambar styraciflua	Sweet Gum	FACW
Ludwigia glandulosa	Ludwigia	OBL
Lyriodendron tulipifera	Tuliptree	FACU+
Nyssa sylvatica	Tupelo	FACW+
Onoclea sensibilis	Sensitive fern	FACW
Populus deltoides	Cottonwood	FAC+
P. grandidentata	Large-tooth Poplar	FACU
tremoides	Quaking Aspen	FAC
Prunus pennsylvanica	Pin cherry	FACU
Pteris esculenta	Braken fern	FACU
Quercus alba	White oak	FACU
Q. bicolor	Swamp white oak	FACW+
Q. coccinea	Scarlet oak	UPL
Q. palustris	Pin oak	FACW
Q. rubra	Northern red oak	FACU
Q. velutina	Black oak	UPL
Rhus copellina	Dwarf sumac	UPL
Riccia fluitans	Liverwort	NONE
Ricciocarpus natans	Liverwort	NONE
Rosa carolina	Wild rose	FACU-
R. multiflora	Multi-flora rose	FACU
R. nitida	Northeastern rose	UPL
Rubus allegheniensis	Highbush blackberry	FACU+
R. canadensis	Smooth blackberry	UPL
R. hispidus	Swamp dewberry	FACW
R. villosa	Low blackberry	UPL
Salix discolor	Pussy willow	FACW
S. exigua	Sandbar willow	OBL

Table 3. List of Vegetation Species (Con't).

Scientific Name	Common Name	Indicator Category
Sambucus canadensis	Elderberry	FACW-
Solidago altissima	Golden rod	FACU
Sonchus arvensis	Field sow-thistle	FAC-
Spiraea alba	Meadow sweet	FACW+
S. latifolia	Meadow sweet	FACW-
Stenanthium gramineum	Featherbells	FAC
Thelypteris thelypteroides	Marsh fern	FACW
Typha angustifolia	Narrow-leaf cattail	OBL
T. latifolia	Broad-leaf cattail	OBL
Ulmus rubra	Slippery elm	FAC
Verbascum thaspus	Wooly mullein	**UPL**
Verbena urticifolia	White vervain	FAC+
Viburnum prunifolium	Black haw	FACU
Vitis aestivalis	Summer grape	FACU
V. vulpina	Frost grape	FACW-
Xanthorhiza simplissima	Yellowroot	**UPL**

*Species with bold **UPL** indicator status are not listed in the state or national plant lists and have been assigned this status by default.

are important for stormwater and flood retention, and also provide habitat for white-tailed deer, furbearers, songbirds, ruffed grouse, barred owl, and amphibians. The various wetland habitats at the American Chemical Services site are being used by a variety of wildlife species, many of which were observed during the reconnaissance flagging visit, and the field survey visit (Table 4).

ADDITIONAL WETLANDS

At a meeting held by the U.S. EPA project manager on February 28, 1990, FWS was requested to observe the area immediately east of American Chemical Services, adjacent to Colfax Road to determine if wetlands were present. This area was walked during the field reconnaissance flagging visit, which revealed various wetlands, some of which were not indicated on the NWI maps (Figure 6). There is a palustrine, emergent, semi-permanent wetland approximately 7 acres in size about 0.1 mile east of Colfax Road, that is identified on the NWI map. The field check revealed that this wetland extends west and southward within 20-30 feet of the roadway. These wetlands would be classified as a combination palustrine, emergent/scrub-shrub forested area with water regimes ranging between temporary, saturated, seasonal, seasonal saturated, and semi-permanent.

A wetland delineation was not conducted for this area, however, the soil survey maps indicate that portions do contain hydric soils.

ENDANGERED SPECIES

The Highland area of Lake County is represented by many federal and state species of special emphasis/concern, in addition to several federal threatened and endangered species. An annotated list follows:

Fed E	Indiana bat	*Myotis sodalis*
Fed E	Peregrine falcon	(*Falco peregrinus*) *Migratory
Fed T	Pitchers thistle	(*Cirsium pitcheri*)
Sp EM/CN	Great blue heron	(*Ardea herodias*)
	American bittern	(*Botaurus lentiginosus*)
	Black tern	(*Chlidonis niger*)
	Least bittern	(*Ixobrychus exilis*)
	King rail	(*Ralus elegans*)
	Yellow-crowned night heron	(*Nycticorax violaceous*)
	Spotted turtle	(*Clemmys guttata*)
	Western smooth green snake	(*Opheodrys vernalis*)
	Franklin's ground squirrel	(*Spermophilus franklini*)
	Blanding's turtle	(*Emydoidea blandingi*)
	Bald eagle	(*Haliaeetus leucocephalus*) *Historical

This endangered species list constitutes informal consultation only, and is not intended to fulfill the requirement of Section 7 of the Endangered Species Act of 1973, as amended. If, after review of the Phase I Remedial Investigation report, it appears likely that any endangered species may have been/may be affected by this site, it may be necessary to initiate formal consultation. If as a result of further consultation, a "no effect" determination is made regarding endangered species, that determination should be revisited after 1 year for new information, or newly listed species.

Table 4. List of wildlife species observed utilizing the wetland habitats at the American Chemical Services site, Griffith, Indiana April 10-11, 1990.

Scientific Name	Common Name
BIRDS	
Agelaius phoeniceus	Red-winged blackbirds (many)
Aix sponsa	Wood ducks (1 pair)
Anas platyrhynchos	Mallard ducks (2 pairs)
Branta canadensis	Canada geese (1 pair)
Charadrius vociferus	Killdeer (1)
Corvus brachyrhynchos	Common crows (many)
Dendrocopos pubescens	Downy woodpeckers (2)
D. villosa	Hairy woodpeckers (1)
Larus spp.	Gulls (many)
Phasianus colchicus	Ring-necked pheasant (1 male)
Regulus satrapa	Golden-crown kinglets (2)
Richmondena cardinalis	Cardinals (3)
Spinus tristis	American goldfinches (1 pair)
MAMMALS	
Procyon lotor	Raccoon (tracks)
Odocoileus virginianus	White-tailed deer (tracks)
Ondatra zibethicus	Muskrats (3) & den
Sylvilagus floridanus	Eastern cottontails (4)

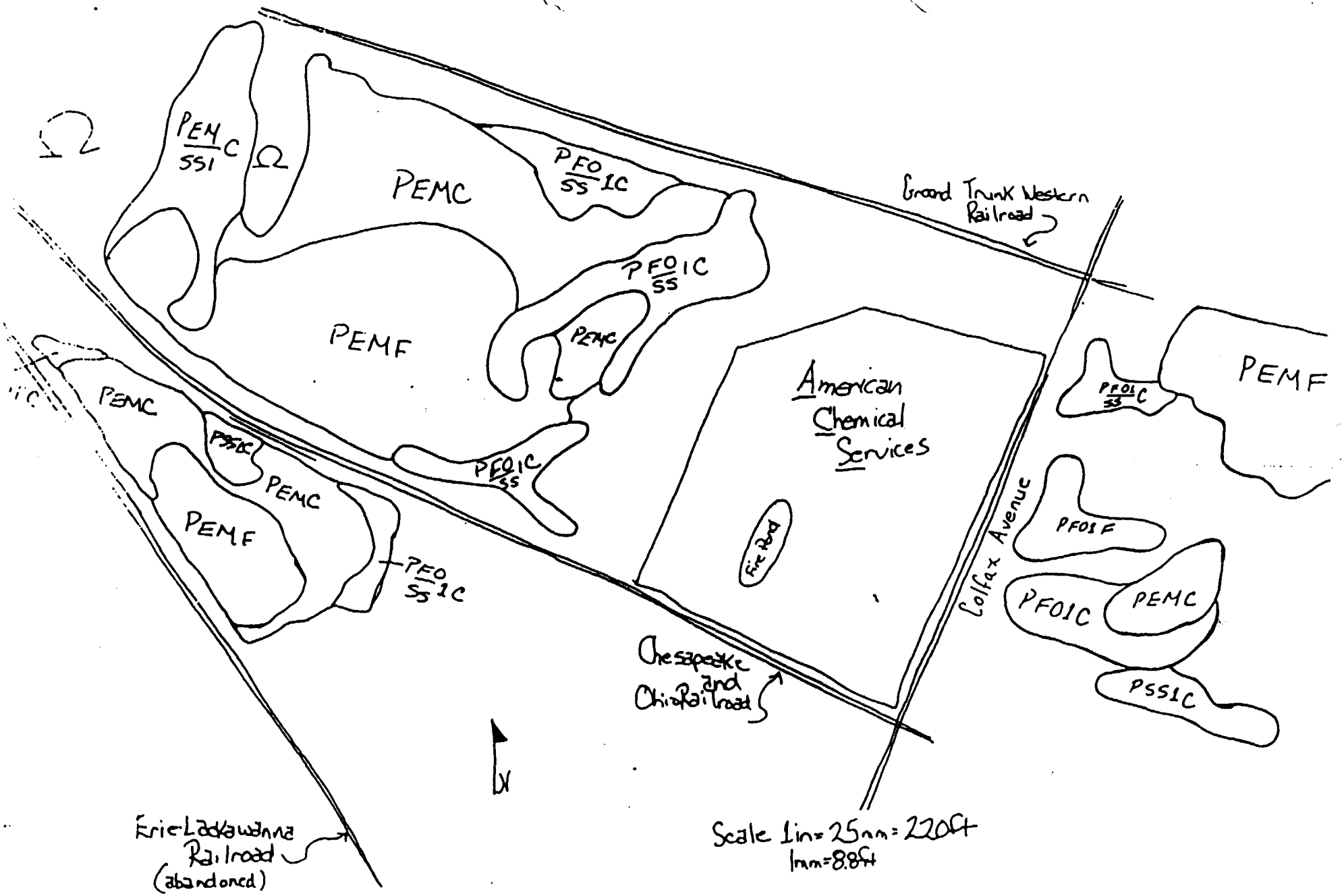


FIGURE 6. Approximate locations and classifications of additional wetlands located near the ACS site, east across Colfax Avenue, Griffith, Indiana.

CONCLUSIONS

1. Wetlands identified on the NWI do exist at the American Chemical Services site.

2. There are wetlands present at the site that are not identified on the NWI. These wetlands consist of palustrine, forested, and scrub-shrub transitional zones between the NWI-identified emergent wetland and upland areas.

3. The wetlands present at the site provide habitat diversity for a variety of wildlife species.

4. The wetlands present on the site possess potential habitat for federal threatened and endangered species, state and federal species of special concern/emphasis, and other birds protected by the Migratory Bird Treaty Act.

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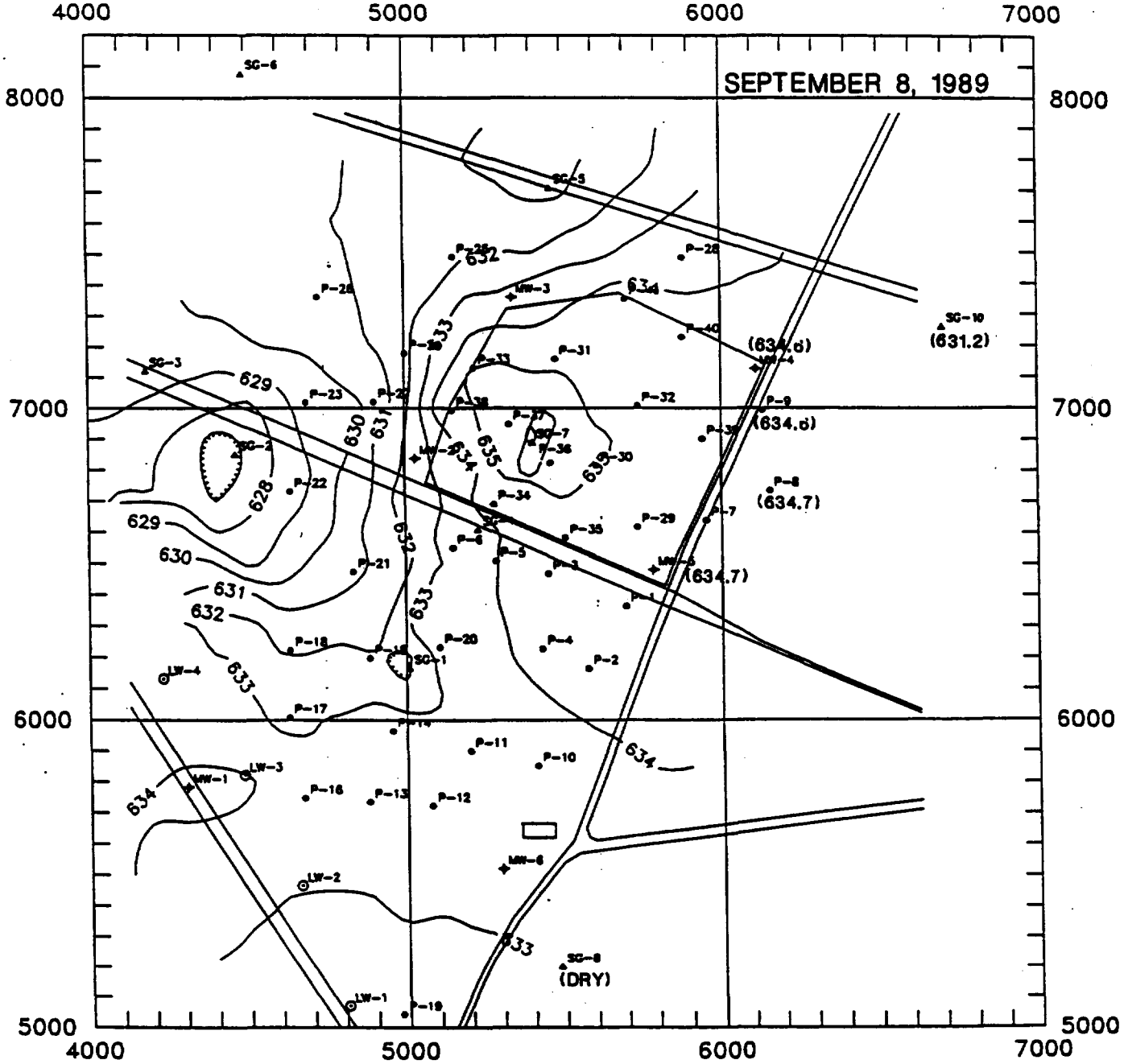
APPENDIX O

Groundwater Elevation Maps



LEGEND

- UPPER AQUIFER MONITORING WELL LOCATION
- LOWER AQUIFER MONITORING WELL LOCATION
- LEACHATE WELL LOCATION
- PIEZOMETER LOCATION
- STAFF GAUGE LOCATION
- —620— WATER LEVEL CONTOUR LINE

NOTES

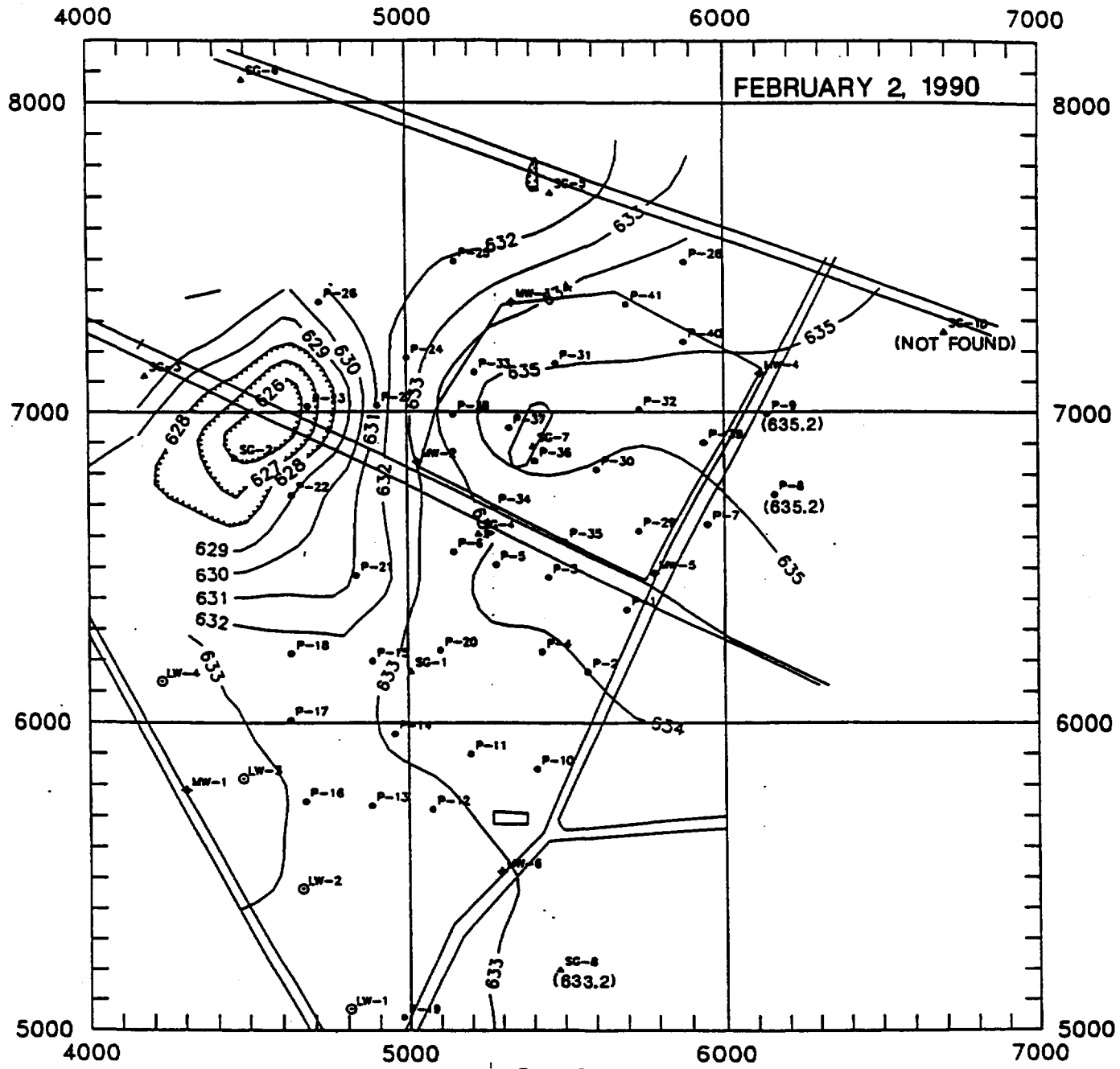
1. THE GROUNDWATER ELEVATION AT P-18 WAS NOT USED IN MAP CONSTRUCTION. THE ELEVATION AT THIS PIEZOMETER WAS APPROXIMATELY 10 FT. HIGHER THAN ADJACENT GROUNDWATER ELEVATIONS.

north

0 500 1000

SCALE IN FEET

WARZYN	WATER TABLE CONTOUR MAP SEPTEMBER 8, 1989	Drawn D.L.L., T.J.M., J.A.W.	Checked	App'd.
	REMEDIAL INVESTIGATION AMERICAN CHEMICAL SERVICES NPL SITE GRIFFITH, INDIANA	Revisions		Date
				60251



NOTES

1. A GROUNDWATER ELEVATION FOR MW-1 WAS NOT AVAILABLE. THIS WELL WAS DESTROYED PRIOR TO WATER LEVEL MEASUREMENT.
2. THE GROUNDWATER ELEVATION AT P-18 WAS NOT USED IN MAP CONSTRUCTION. THE ELEVATION AT THIS PIEZOMETER WAS APPROXIMATELY 10 FT. HIGHER THAN ADJACENT GROUNDWATER ELEVATIONS.

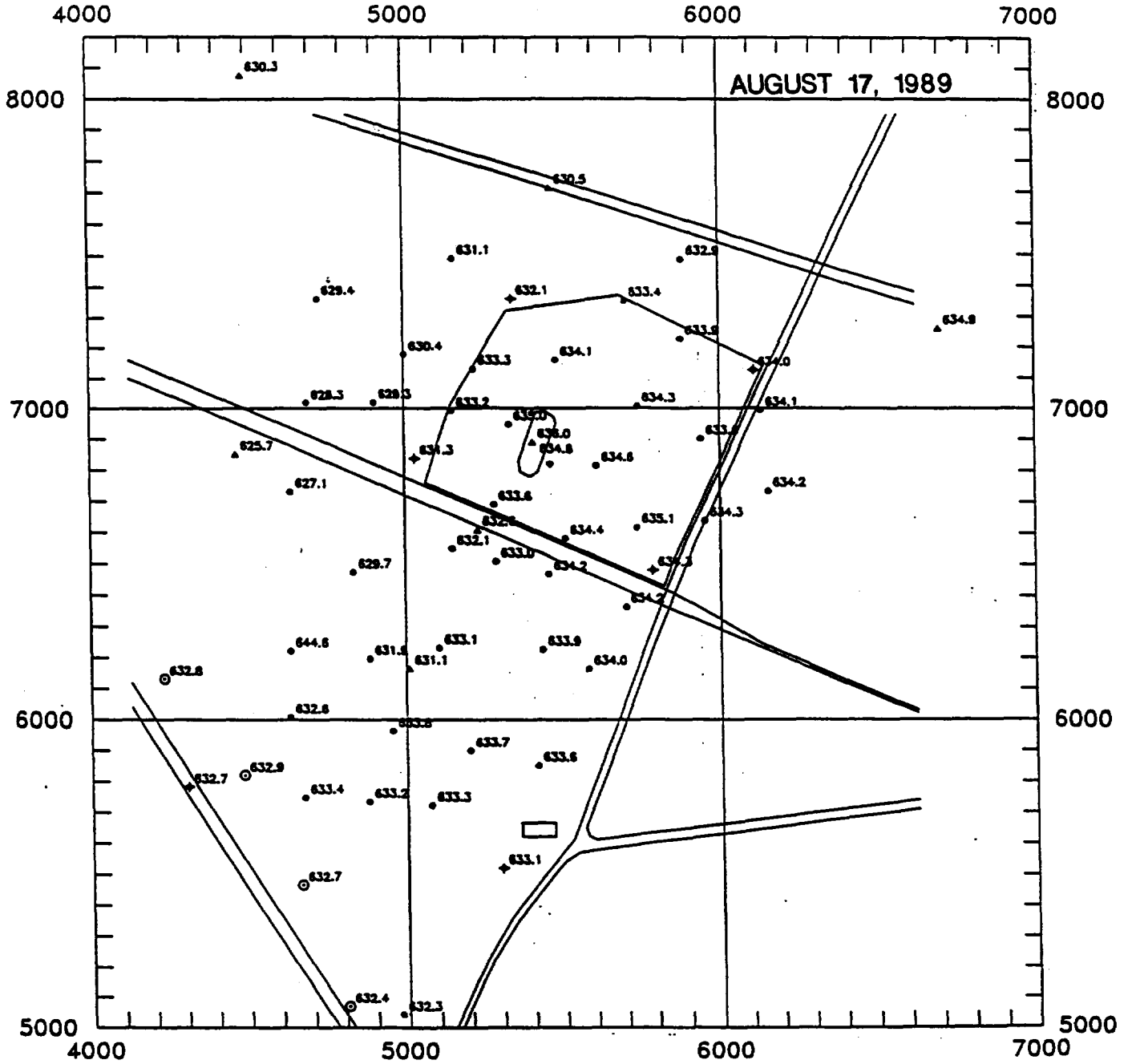
LEGEND

- UPPER AQUIFER MONITORING WELL LOCATION
- LOWER AQUIFER MONITORING WELL LOCATION
- LEACHATE WELL LOCATION
- PIEZOMETER LOCATION
- STAFF GAUGE LOCATION
- —620— WATER LEVEL CONTOUR LINE

0 500 1000
SCALE IN FEET

north

WARZYN	WATER TABLE CONTOUR MAP FEBRUARY 2, 1990 REMEDIAL INVESTIGATION AMERICAN CHEMICAL SERVICES NPL SITE GRIFFITH, INDIANA	Drawn D.L.L., T.J.M., J.A.W. Revisions	Checked App'd. Date 60251



LEGEND

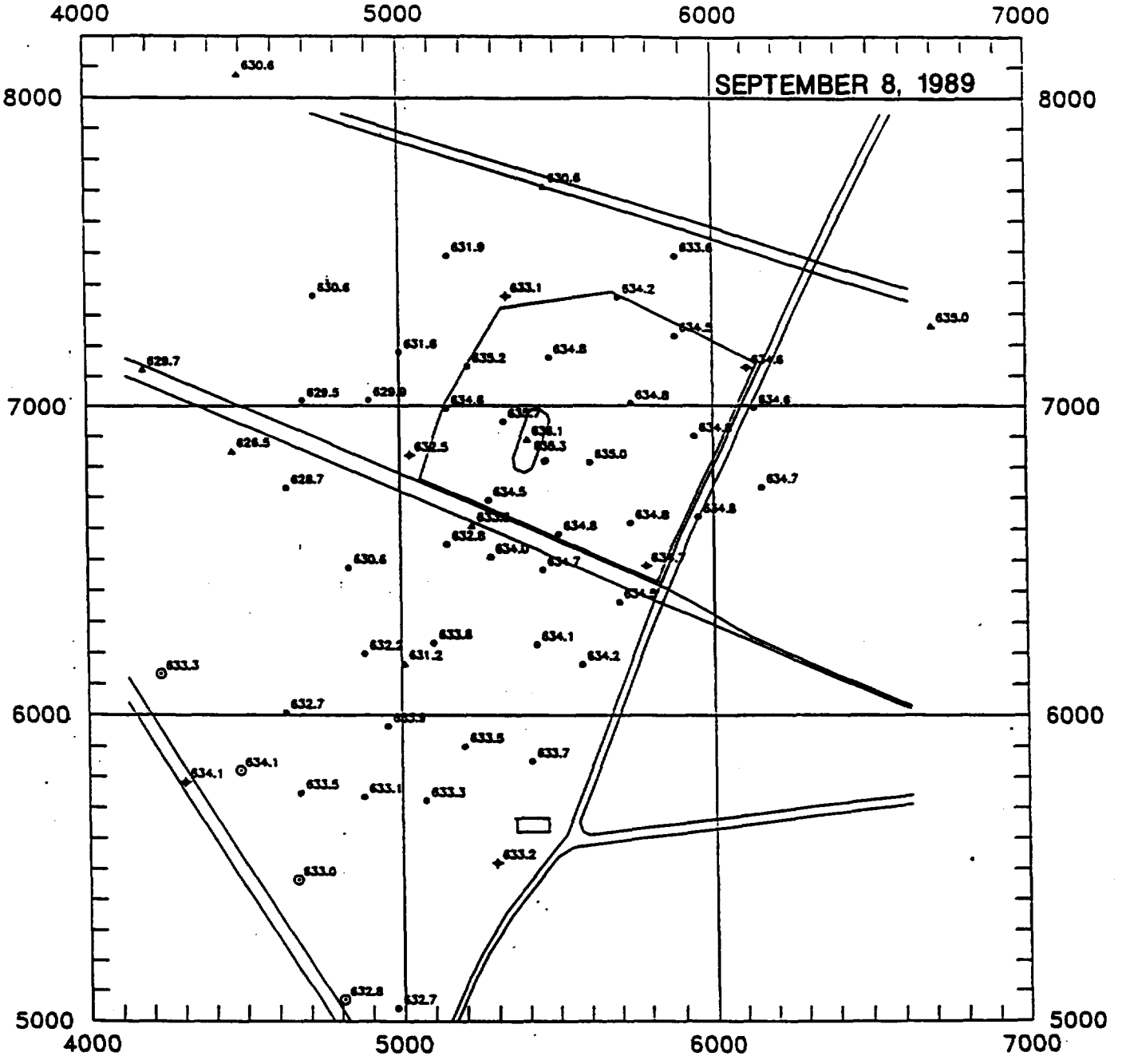
- ◆ UPPER AQUIFER MONITORING WELL LOCATION
- ◇ LOWER AQUIFER MONITORING WELL LOCATION
- ⊙ LEACHATE WELL LOCATION
- ● PIEZOMETER LOCATION
- ▲ STAFF GAUGE LOCATION

north

0 500 1000

SCALE IN FEET

WARZYN	MEASURED WATER LEVELS AUGUST 17, 1989	Drawn D.L.L., T.J.M., J.A.W.	Checked	App'd.
	REMEDIAL INVESTIGATION AMERICAN CHEMICAL SERVICES NPL SITE GRIFFITH, INDIANA	Revisions		Date
				60251



LEGEND

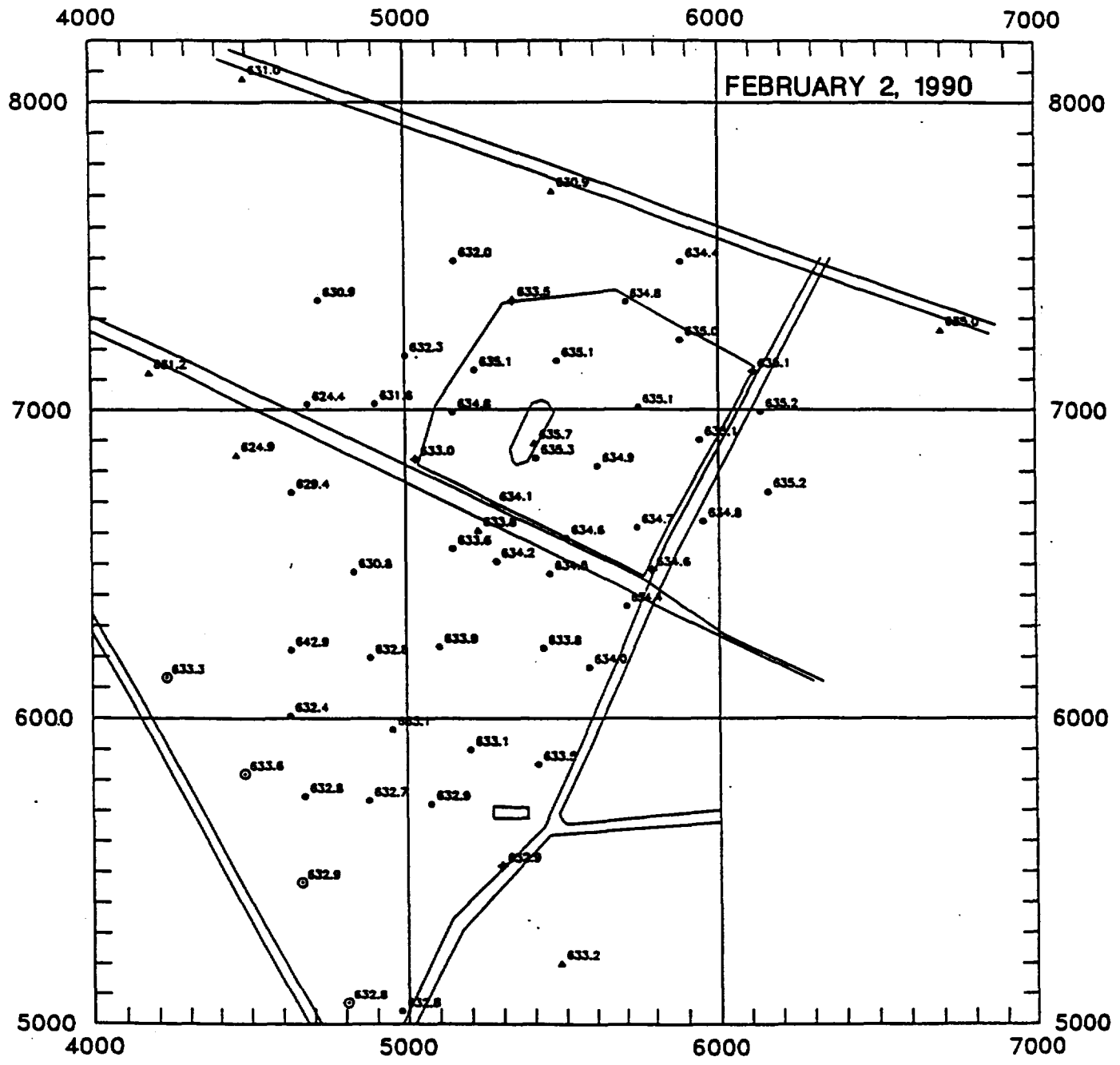
- ◆ UPPER AQUIFER MONITORING WELL LOCATION
- ◇ LOWER AQUIFER MONITORING WELL LOCATION
- ⊙ LEACHATE WELL LOCATION
- ● PIEZOMETER LOCATION
- ▲ STAFF GAUGE LOCATION

north

0 500 1000

SCALE IN FEET

WARZYN	MEASURED WATER LEVELS SEPTEMBER 8, 1989	Drawn D.L.L., T.J.M., J.A.W.	Checked	App'd.
	REMEDIAL INVESTIGATION AMERICAN CHEMICAL SERVICES NPL SITE GRIFFITH, INDIANA	Revisions		Date 60251



LEGEND

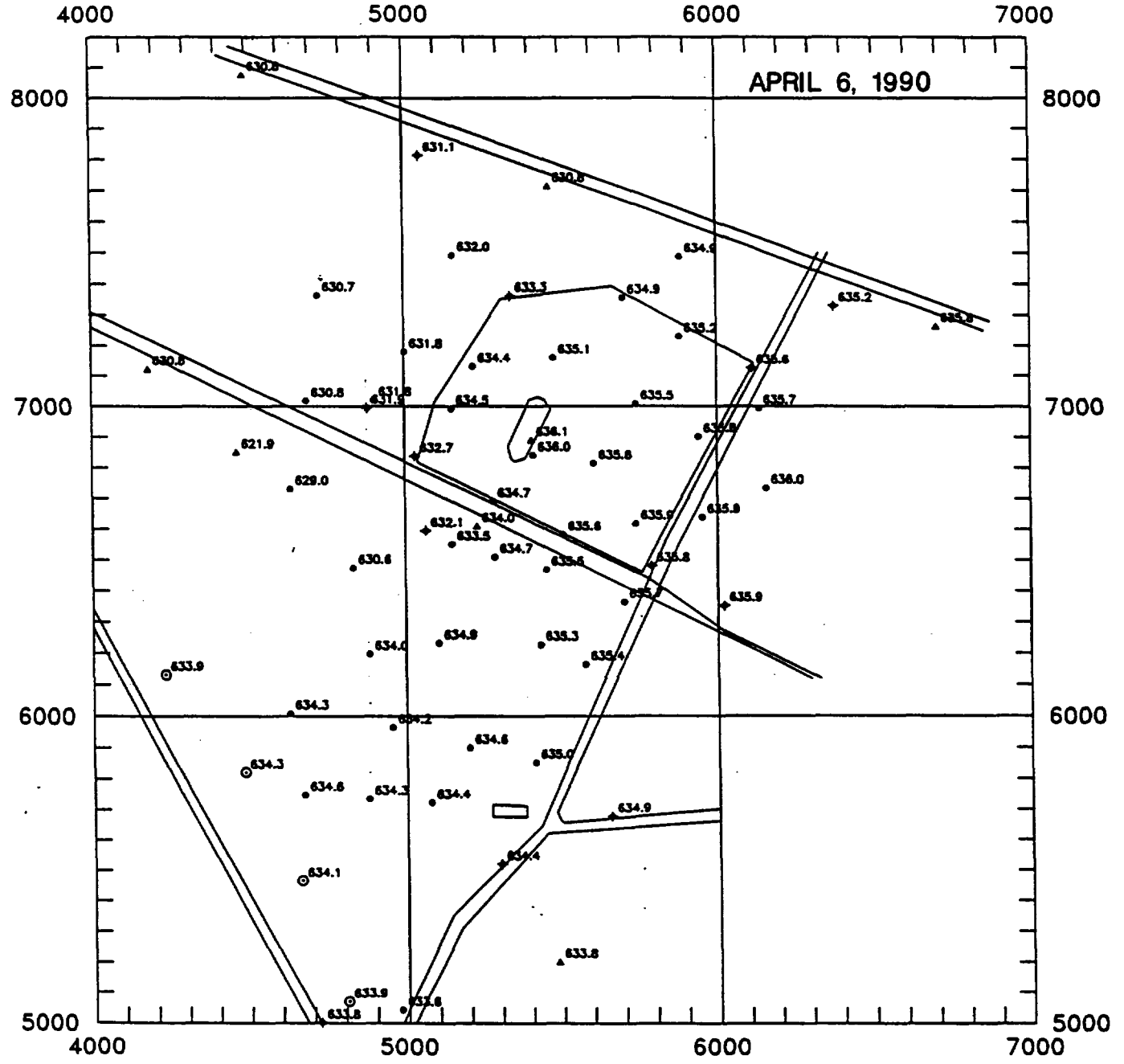
- ◆ UPPER AQUIFER MONITORING WELL LOCATION
- ◇ LOWER AQUIFER MONITORING WELL LOCATION
- ⊙ LEACHATE WELL LOCATION
- ● PIEZOMETER LOCATION
- ▲ STAFF GAUGE LOCATION

north

0 500 1000

SCALE IN FEET

WARZYN	MEASURED WATER LEVELS FEBRUARY 2, 1990	Drawn D.L.L., T.J.M., J.A.W.	Checked	App'd.
	REMEDIAL INVESTIGATION AMERICAN CHEMICAL SERVICES NPL SITE GRIFFITH, INDIANA	Revisions		Date
				60251



LEGEND

- UPPER AQUIFER MONITORING WELL LOCATION
- LOWER AQUIFER MONITORING WELL LOCATION
- LEACHATE WELL LOCATION
- PIEZOMETER LOCATION
- STAFF GAUGE LOCATION

north

0 500 1000

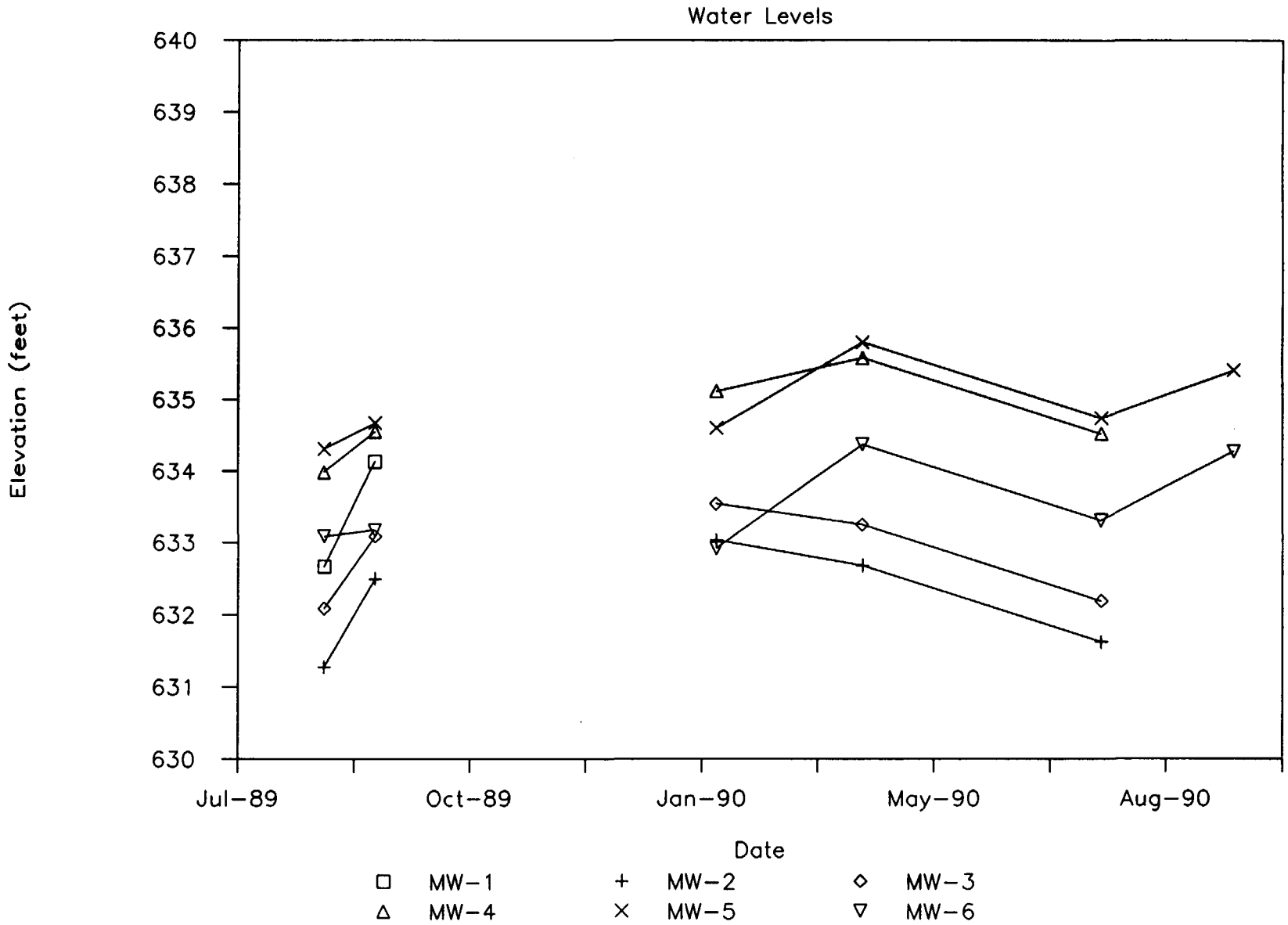
SCALE IN FEET

WARZYN	MEASURED WATER LEVELS APRIL 6, 1990	Drawn D.L.L., T.J.M., J.A.W.	Checked	App'd.
	REMEDIAL INVESTIGATION AMERICAN CHEMICAL SERVICES NPL SITE GRIFFITH, INDIANA	Revisions		Date 60251

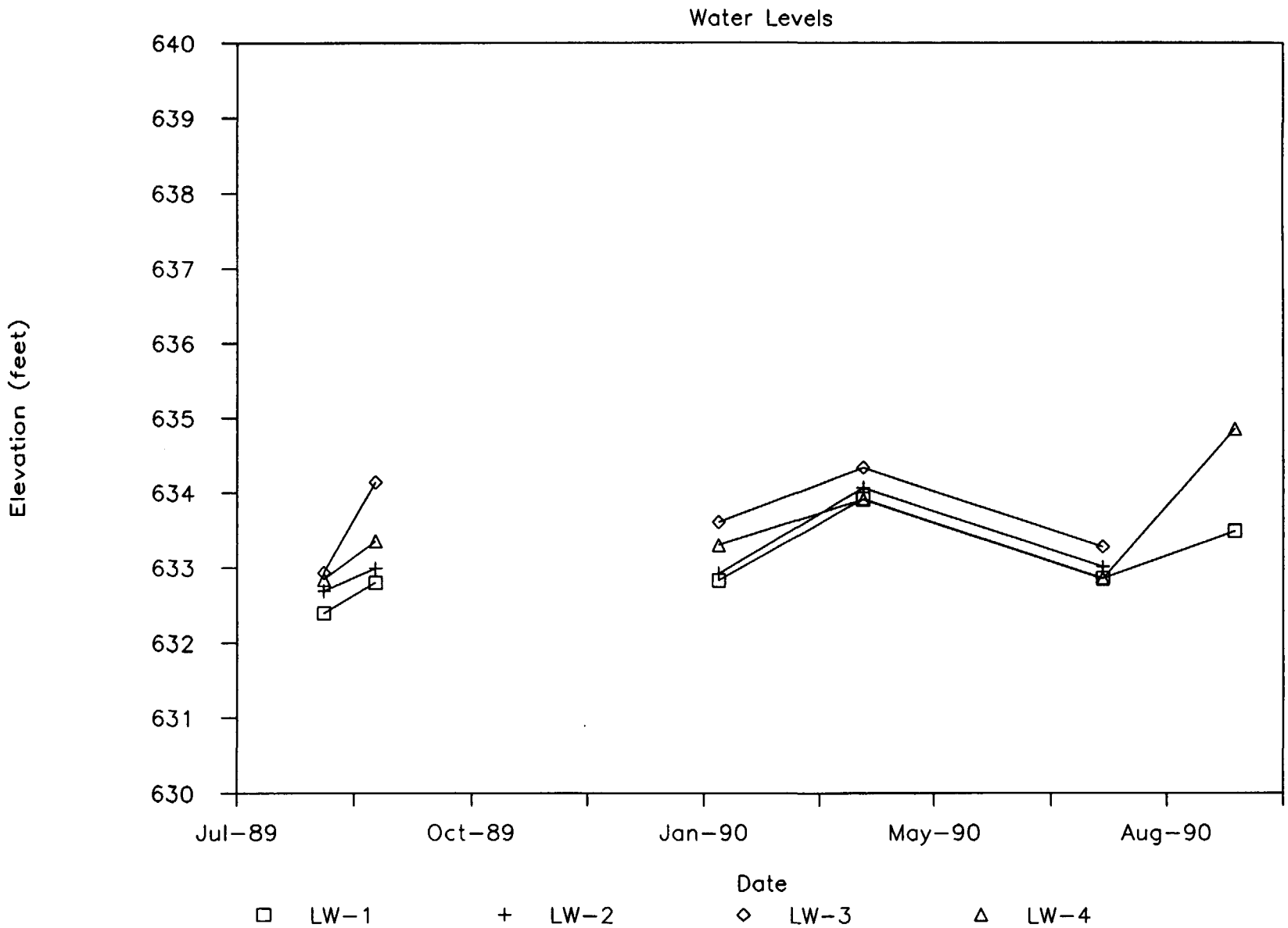
APPENDIX P

Groundwater/Surface Water Hydrographs

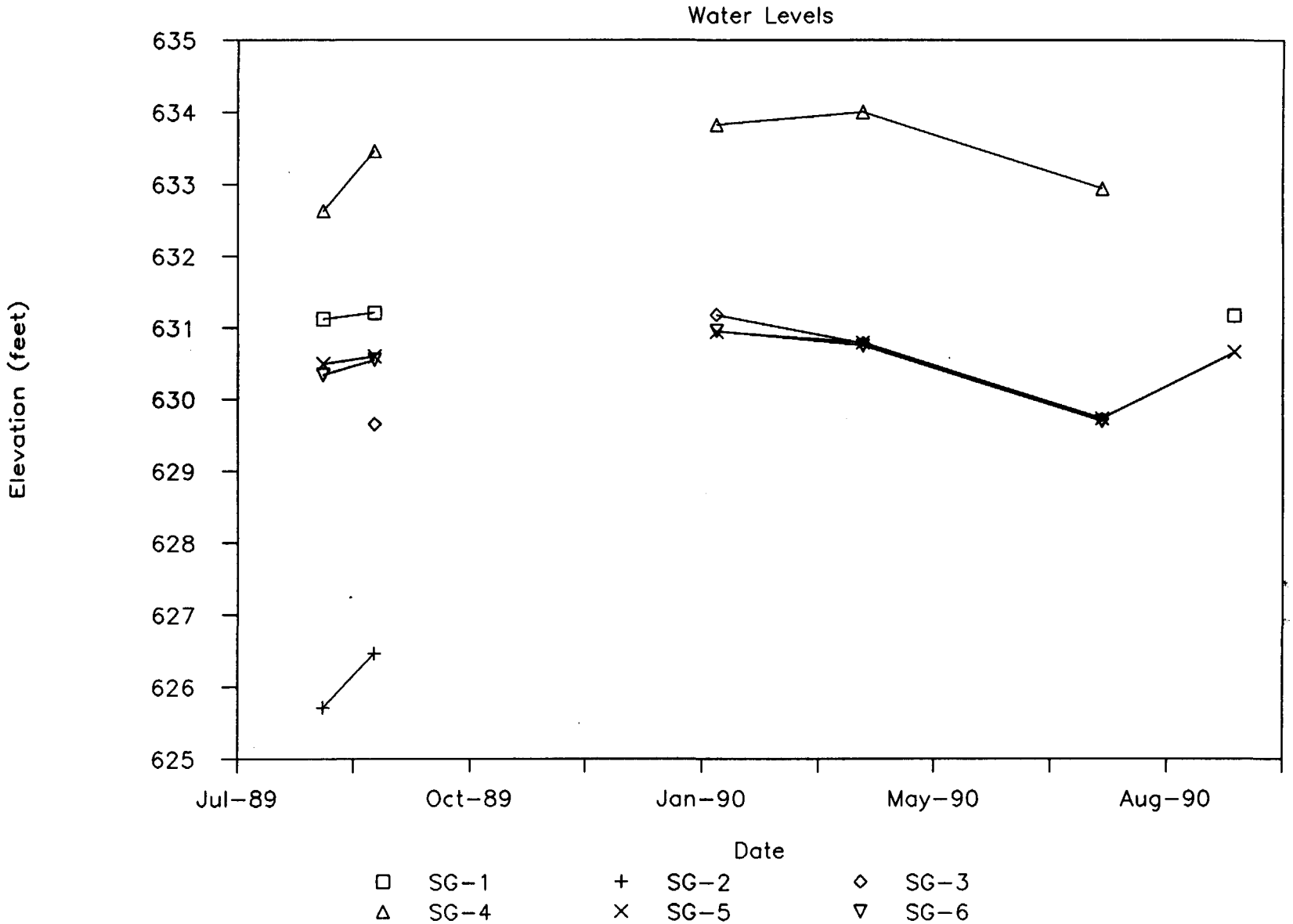
MW-1 through MW-6

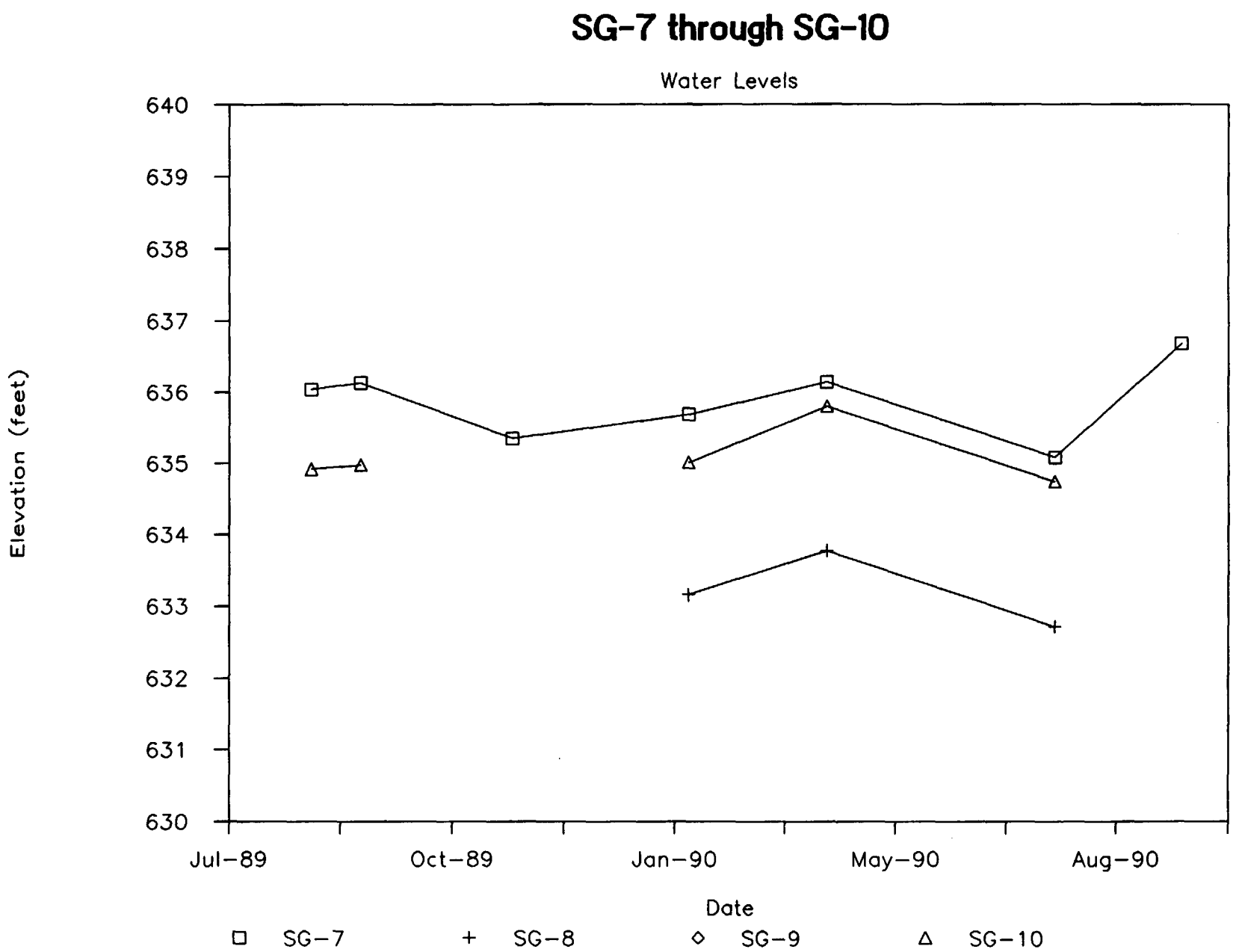


LW-1 through LW-4

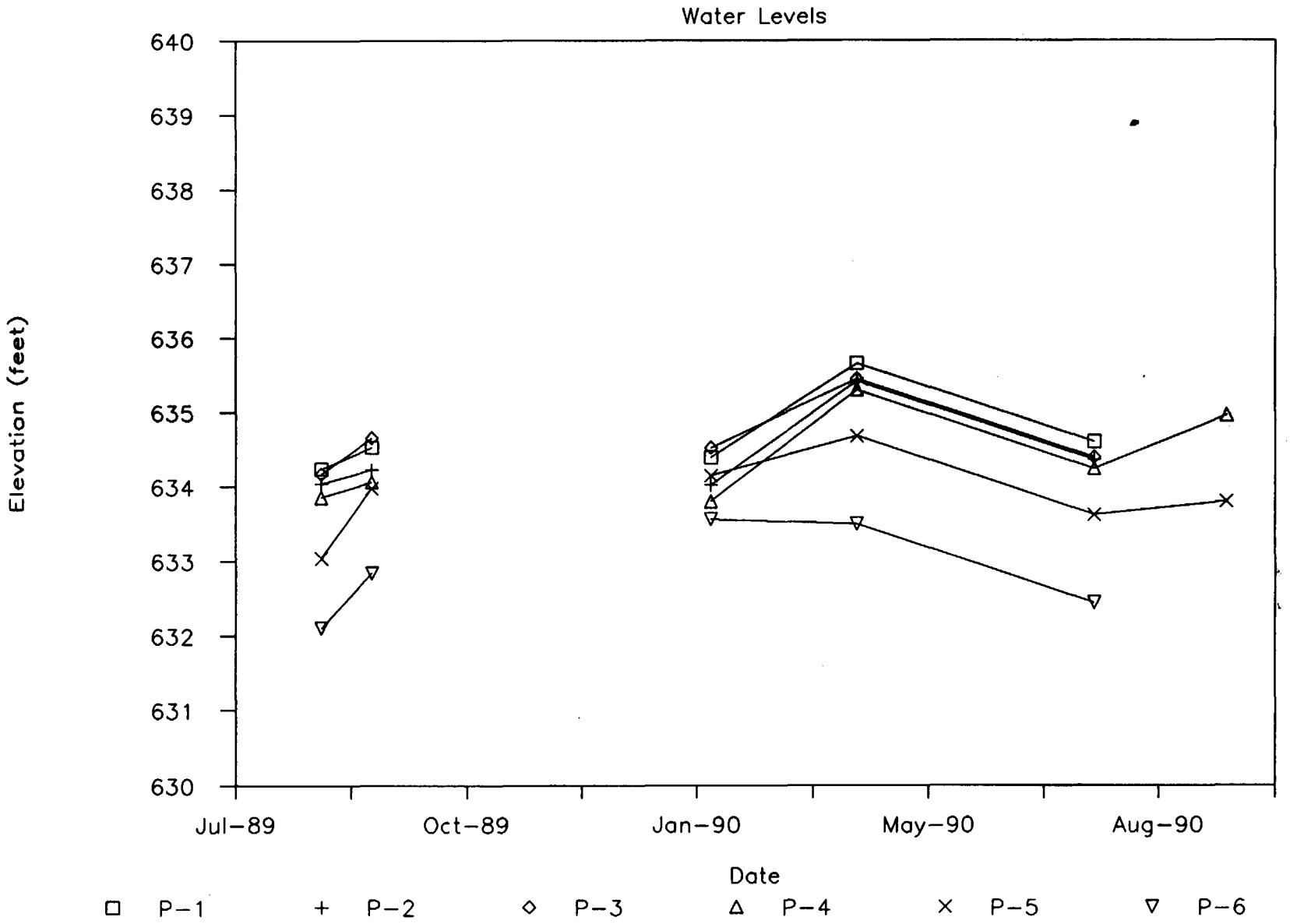


SG-1 through SG-6

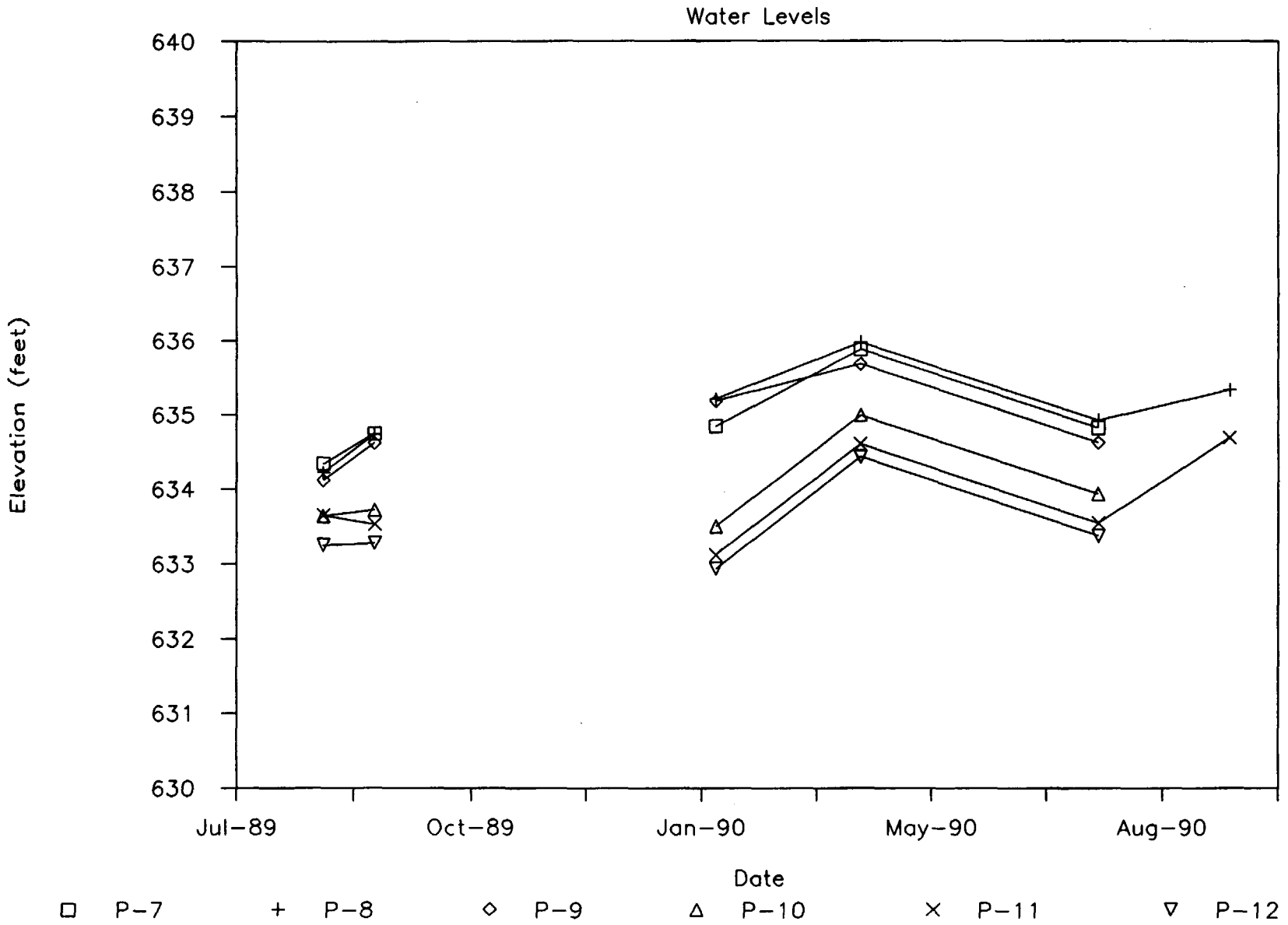



SG-7 through SG-10
Water Levels
640
639
638
637
636
635
634
633
632
631
630
Elevation (feet)
Jul-89
Oct-89
Jan-90
May-90
Aug-90
Date
SG-7
SG-8
SG-9
SG-10

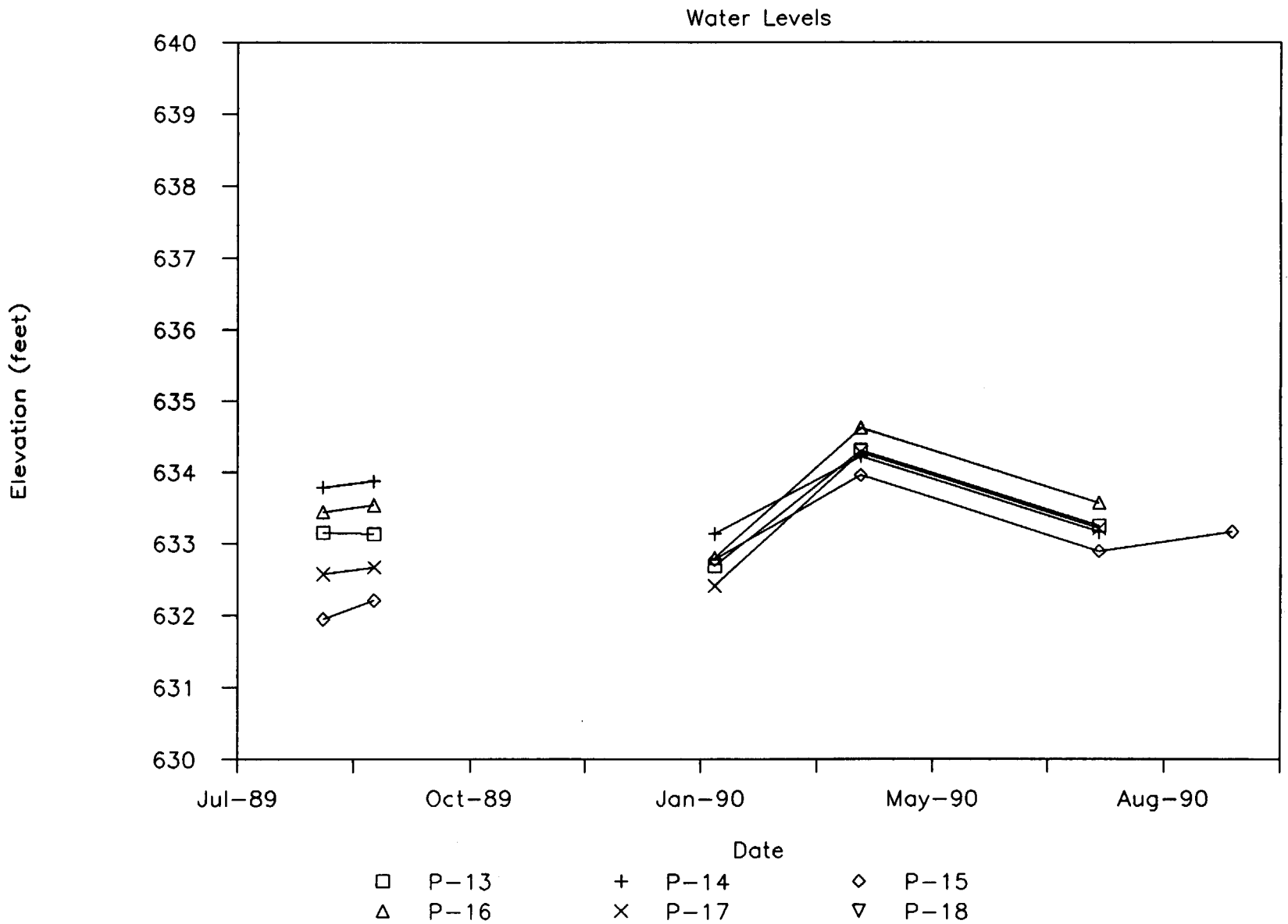
P-1 through P6



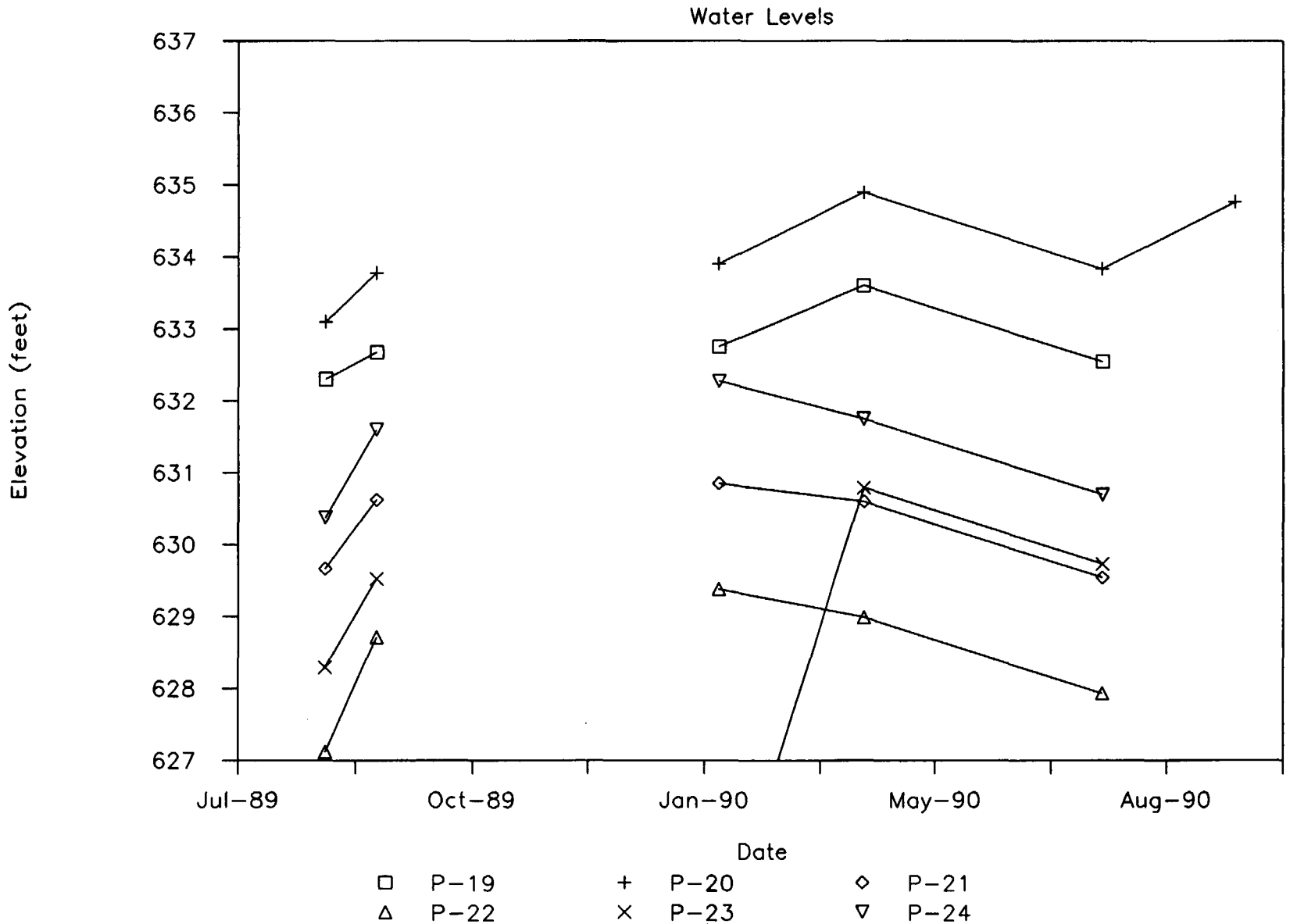
P-7 through P12



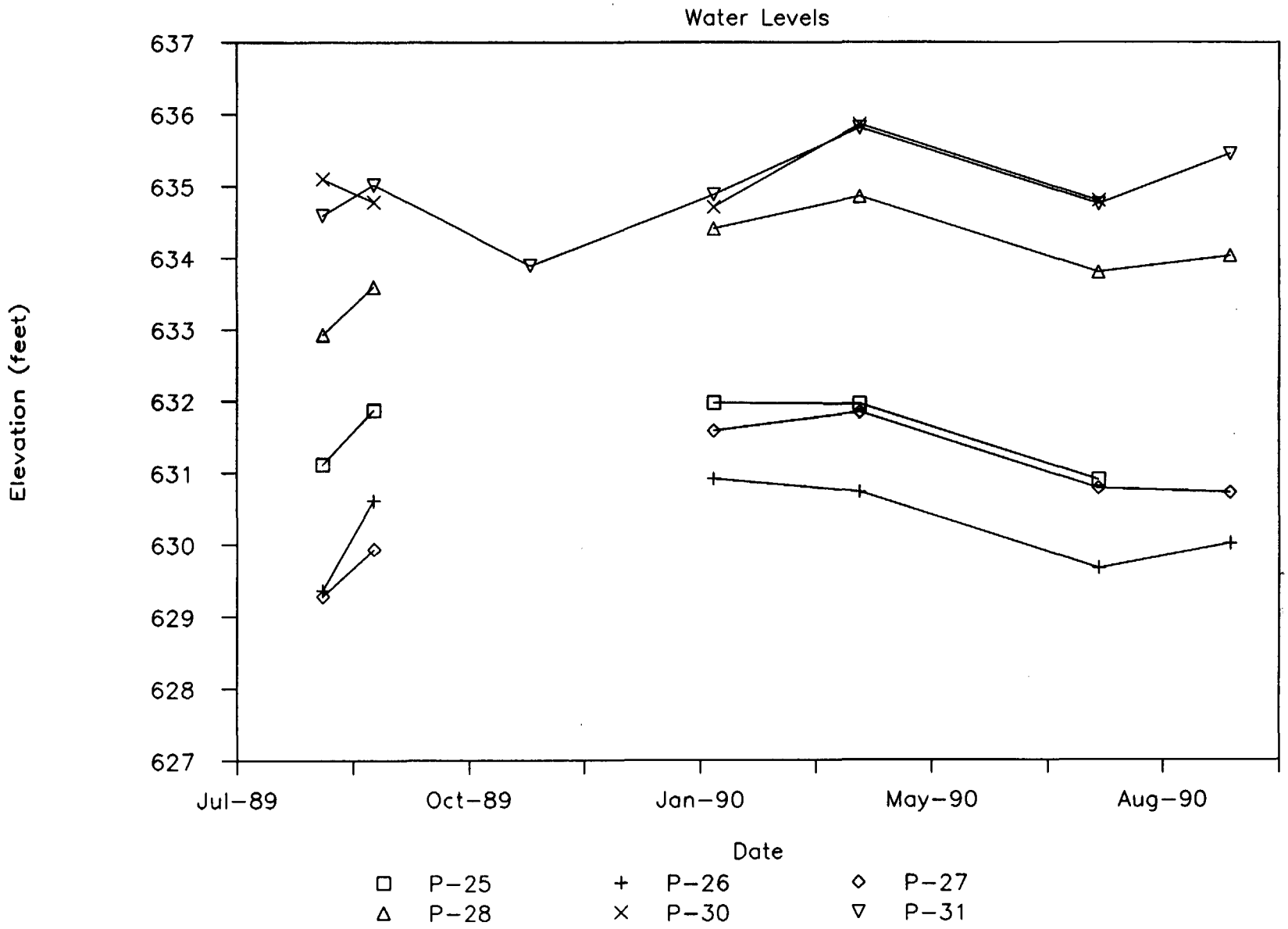
P-13 through P-18



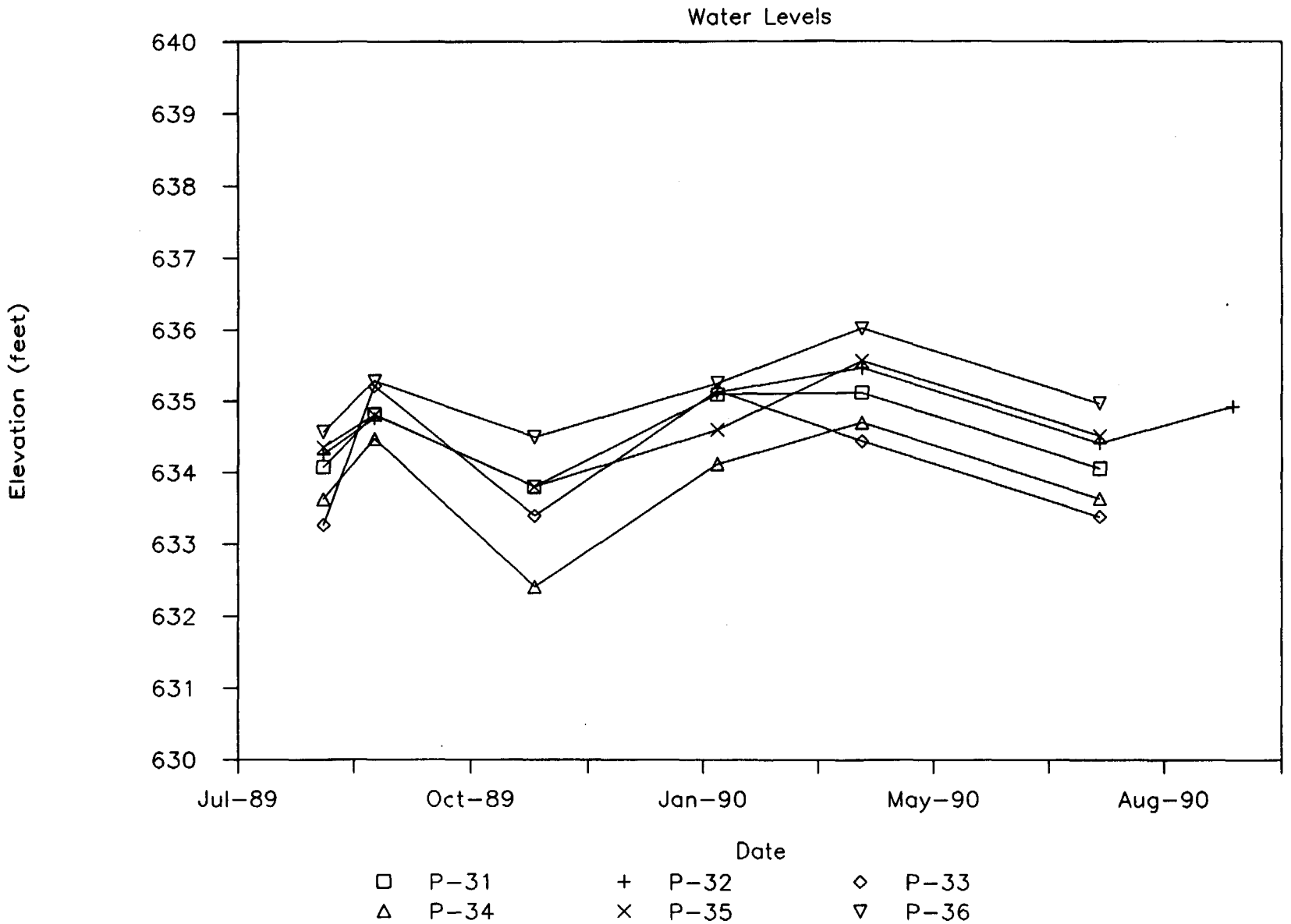
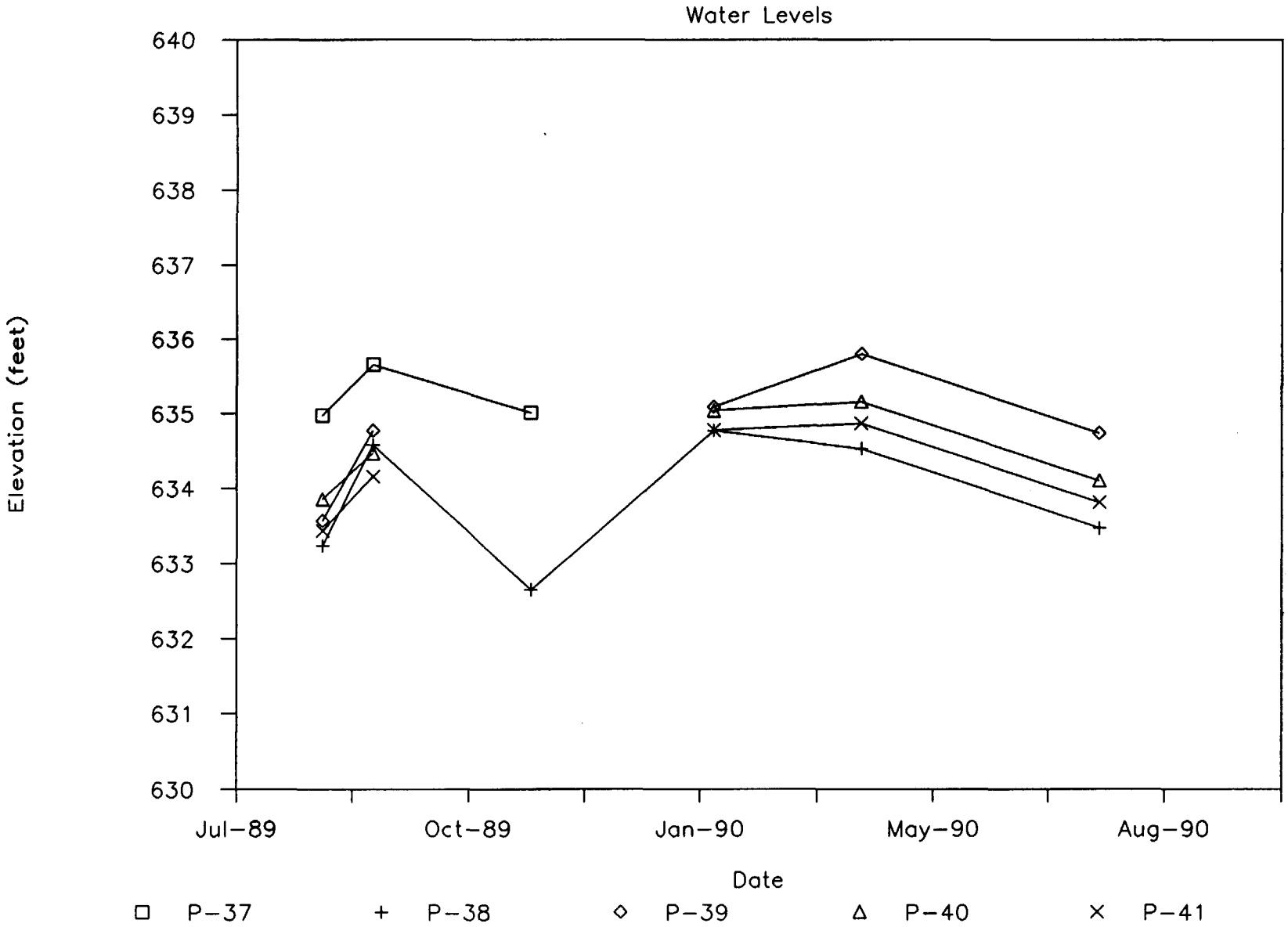
P-19 through P-24



P-25 through P-30



P-31 through P-36



P-37 through P-41