FOHO 332

File

Jack Wright's Landfill - 13 acres

POLLUTION CONTROL SCIENCE, INC.

6015 Manning Road, Miamisburg, Ohio 45342 (513) 866-5908

March 30, 1977

US EPA RECORDS CENTER REGION 5

454413

Mr. Gary M. Bramble
Chief, Environmental Evaluation
Division of Surveilance
OHIO EPA
Southwest District Office
7 East Fourth Street
Dayton, Ohio 45042

Dear Mr. Bramble:

Subject: Land Application of Wastewater Treatment Sludge
Hobart Brothers Company - Troy, Ohio

The Hobart Brothers Company operates a manufacturing facility (Westbrook Plant) in Troy, Ohio that manufactures welding equipment and supplies. In the process of manufacturing welding wire, a small volume of wastewater is generated which is treated and discharged to the municipal sewerage system. As a result of treating the wastewater, a small volume of sludge is generated. As indicated in Table 1, the sludge consists primarily of iron probably in the form of ferric hydroxide. Other metals are very low in concentration and insignificant with regard to environmental impact. It is estimated that Hobart Brothers generate approximately 50,000 gallons of 10 percent solids sludge every six months.

Small!!

Since Hobart Brothers Company owns 32 acres of unoccupied land approximately ½ mile north of the Westbrook Plant, they are requesting permission to dispose of the wastewater treatment sludge on approximately 10 acres of this land. The location of this property is shown in Attachment A and B. Photographs of the land are also attached to this letter.

To determine the environmental impact of land spreading the sludge, the application rate and final soil concentrations of the metals were calculated. The results are listed in Table 1. The probable fates of all metals were also assessed and listed in Table 2. The available literature was also reviewed with regard to impact of metals on soils. Three articles which summarize the current "State of Art" are attached to this letter.

After reviewing the data and the literature, it is my opinion that land spreading the wastewater treatment sludge is an acceptable method of disposal. The toxic metals are very low in concentration and would pose no environmental hazard.

Some of the metals such as Calcium, Magnesium, Sodium and Potassium would probably leach into the ground water but the rate would be very slow and the amount would be insignificant.

Although iron is the principal metal, it is not toxic or potentially hazardous. Because iron forms insoluble precipates (hydroxide and phosphate), the iron would remain in the top layer and be relatively immobilized. If the iron were reduced from ferric to ferrous which is a more soluble form, the movement through the soil would be very slow.

The sludge would be applied to the land with a tank truck equipped with a spreader and applied at a rate of approximately 5000 gallons/acre. The terrain is such that no run-off is anticipated.

If you require more information regarding this request, please contact me.

Sincerely,

Submitted by:

Phillip L. Hayden

Phillip L. Hayden, Ph.D., P.E.
President (PCS)

STATE OF OHIO
PHILLIP
LEE
HAYDEN
E-040912
REGISTERED
PROFESSIONAL ENGINEER

Authorized by:

R.T. Lefever
Vice President and General Manager
Filler Metals Division
Hobart Brothers Company
Troy, Ohio 45373

TABLE 1

LAND APPLICATION OF WASTEWATER TREATMENT SLUDGE

ANALYTE	CONC. IN SAMPLE (dry solids basis) mg/g	APPLICATION RATE lbs/acre (2)	CONC. IN SOIL ppm (3)
Aluminum	0.93	4.18	1.27
Arsenic	NDL(1)		
Calcium	0.092	0.42	0.13
Cadmium	0.010	0.045	0.014
Copper	0.117	0.53	0.16
Chromium	0.097	0.44	0.13
Iron	400.	1800.	550.
Lead	0.23	1.04	0.32
Magnesium	3.6	16.2	4.96
Manganese	2.4	10.8	3.31
Mercury	< 0.003		
Nickel	0.69	3.11	0.95
Silver	0.003	0.014	0.004
Tin	< 0.010		
Zinc	0.37	1.67	0.51
Barium	0.003	0.014	0.004
Beryllium	0.001	0.0045	0.002
Molybdenum	0.41	1.85	0.57
Potassium	0.088	0.40	0.12
Sodium	6.6	29.7	9.09
Selenium	NDL(1)		

(1)NDL - No Detectable Level

(2)Application Rate - 5,000 gallons/acre, 10% solids, 4500 lbs dry solids/acre

(3)Assume top soil 12" deep, density 75 lbs/ft^3

TABLE 2

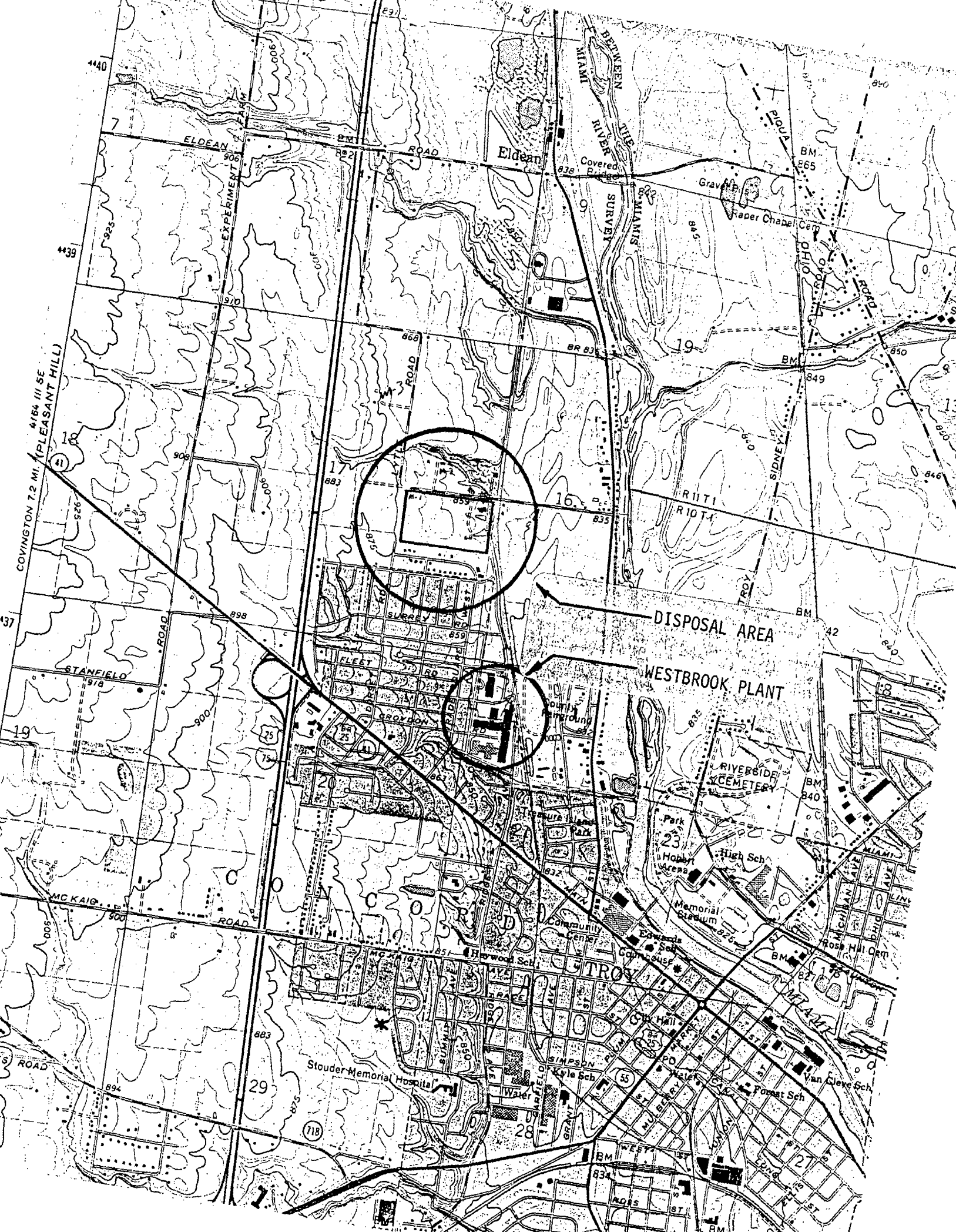
FATE OF METALS APPLIED TO LAND

METAL	FATE
Aluminum	Precipate as $Al(OH)_3$, $AlPO_4$ Remains in top soil
Arsenic	-
Calcium	Forms soluble salts Will leach into ground water
Cadmium	Probably will form chelates and adsorp on soil particles Will slowly leach into ground water
Copper	" "
Chromium	" "
Iron	Remains as Fe_2O_2 or $Fe(OH)_3$ Forms chelates with humic fraction of soil Will slowly leach as Ferric is reduced to Ferrous
Lead	Lead precipates are relatively soluble, probably will chelate and slowly leach into ground water
Magnesium	Forms soluble salts Will leach into ground water
Mercury	-
Nickel	Probably will form chelates and adsorp on soil particles. Will slowly leach into ground water
Silver	Probably will precipate as AgCl Will remain in top soil

TABLE 2 (Cont'd)

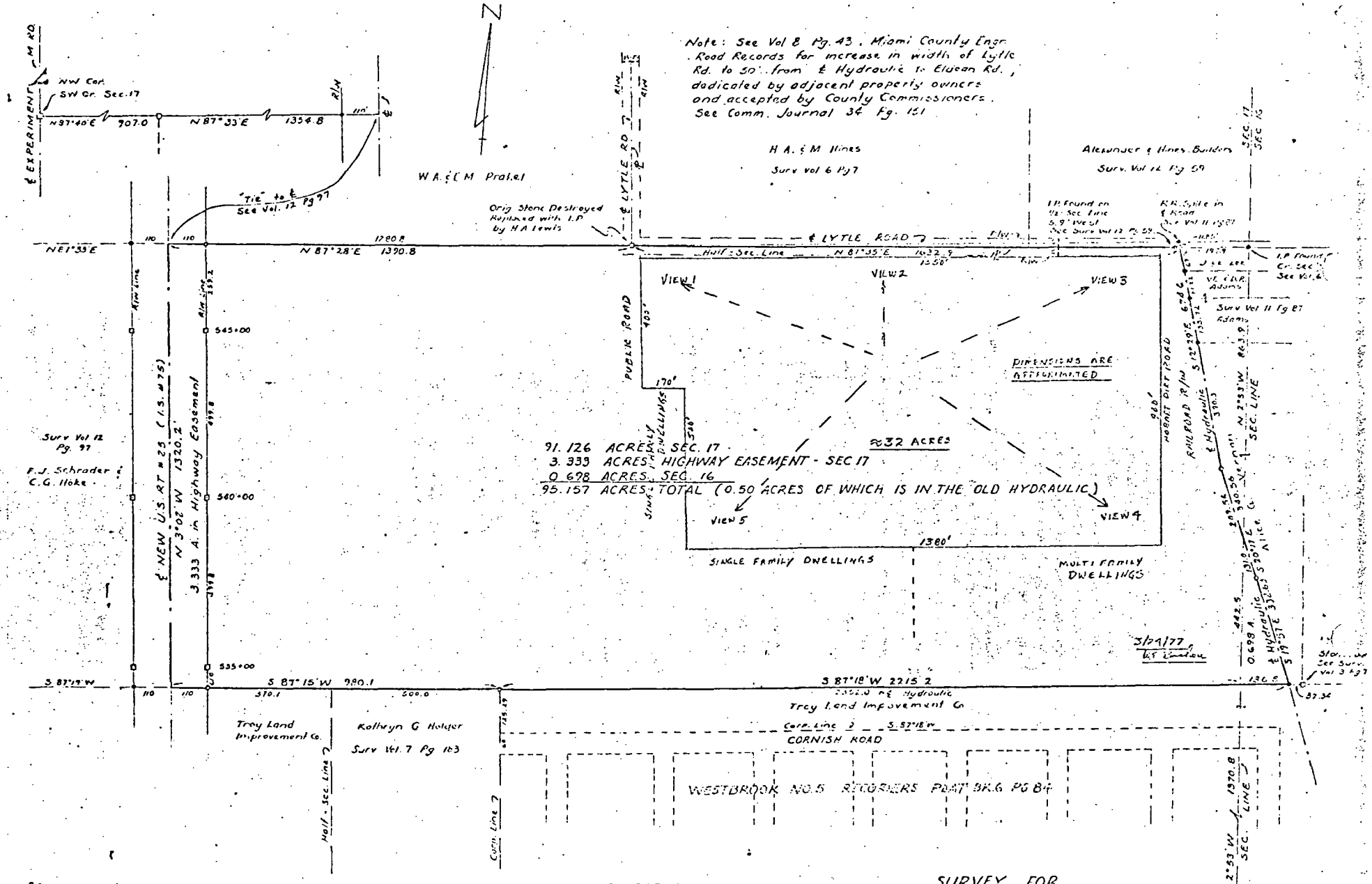
FATE OF METALS APPLIED TO LAND

METAL	FATE
Tin	Probably will form chelates and absorp on soil particles Will slowly leach into ground water
Zinc	" "
Barium	Probably will precipate as $BaSO_4$ Will remain in top soil
Beryllium	Unknown
Molybdenum	Unknown
Potassium	Forms soluble salts Will leach into ground water
Sodium	Forms soluble salts Will leach into ground water
Selenium	-


DISPOSAL AREA
WESTBROOK PLANT
Eldean
Covered Bridge
ELDEAN ROAD
EXPERIMENT FARM
BETWEEN THE MIAMI RIVER
MIAMIS SURVEY
PIQUA ROAD
OHIO ROAD
SIDNEY
TROY
R 11 T 1
R 10 T 1
COVINGTON 7.2 MI. (PLEASANT HILL)
4164 III SE
STANFIELD ROAD
MC KAIG ROAD
SURREY RD
FLEET RD
CROYDON RD
RIVERSIDE CEMETERY
Treasure Island Park
Hobart Arena
High Sch
Memorial Stadium
Community Center
Edwards Sch
Courthouse
Rose Hill Cem
Haywood Sch
City Hall
Stouder Memorial Hospital
Kyle Sch
Forest Sch
Van Cleve Sch
Water
MIAMI
SIMPSON
MULBERRY
WEST
UNION
GRANT
GARFIELD
ROSS ST
BM
CONCORD

CONCORD TOWNSHIP | 5 TOWN | 6 RANGE | 16 & 17 SECTION

MIAMI COUNTY ENGINEERS
RECORD OF LAND SURVEYS
SCALE 1" = 200'
DECEMBER 12, 1957



LEGEND

- ○ Denotes Iron Pin Set
- ● Denotes Iron Pin Found
- ▲ Denotes Stone Found
- 540+00 ○ Denotes State Hwy R/W Mon.

REFERENCE:

Engr.	Land	Surv.	Vol.	3	Pg.	79
"	"	"	"	6	"	7
"	"	"	"	7	"	183
"	"	"	"	11	"	87
"	"	"	"	12	"	59
"	"	"	"	12	"	97
Recorders		Plat	Bk.	6	Pg.	84
"		Deed	Bk.	279	"	393
Trans. Plat Recorders Vol. 8					"	43

SURVEY FOR
W. H. TELFORD

Richard W. Klopner
RICHARD W. KLOPNER
REGISTERED SURVEYOR #7370