



CITY OF LAWRENCEBURG
WELLHEAD PROTECTION AREA PLAN

Prepared for:

CITY OF LAWRENCEBURG
Lawrenceburg Municipal Utilities
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Approved by IDEM
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1.0 INTRODUCTION

This Wellhead Protection Area (WHPA) delineation report has been prepared by Hydrophase, Inc. for the City of Lawrenceburg, to begin the process of wellhead protection planning, as required by the Indiana Wellhead Protection Program (WHPP). Hydrophase, Inc. was retained by the city to prepare the WHPA for the new fairgrounds wellfield, and a backup well near Tanners Creek. Lawrenceburg Municipal Utilities supplies water for potable and other uses for a population of approximately 4,700 in and around Lawrenceburg. Sections 1.1 and 1.2 discuss the Indiana WHPP document (IDEM, 1997)

1.1 Regulatory Background

Protection initiatives for public water supply systems (PWSSs) in Indiana date back at least to the 1930's, when the state began an informal policy requiring a 200 foot minimum setback between a PWSS well or wellfield and any source of bacteriological contamination such as sanitary sewers. Currently, a site approval for new wells and wellfields is issued by the Indiana Department of Environmental Management (IDEM) as a condition of acquiring a well construction permit. The approval process includes an assessment of land use within a 3,000 foot radius of the proposed well or wellfield to consider potential sources of contamination that could impact the wellfield.

With the implementation of a WHPP, a more proactive approach to protecting public water supplies from contamination is being promoted. The WHPP considers not only the location of the well, but also the surface area above the part of the aquifer that contributes water to the wellfield under pumping conditions. Therefore, the driving force behind the WHPP is to manage the aquifer so that the potential for pollution in the contributing areas is minimized. Pollution prevention pays for itself in the long run by reducing the potential for the much higher cost of cleaning up contaminated groundwater.

The Federal Safe Drinking Water Act (SDWA) of 1986 required each state to establish a WHPP to protect groundwater supplied by PWSSs. Under the SDWA, each state must prepare a wellhead protection program for approval by the U.S. EPA. Prior to developing a WHPP, the State of Indiana authorized the Water Pollution Control Board (Ground Water Protection Act, IC 13-7-26-7) to establish regulations to protect PWSS wellfields from contamination.

IDEM, the agency responsible for administering wellhead protection in the State of Indiana, has received approval from the EPA for its WHPP. The final adoption by the Water Pollution Control Board occurred on July 10, 1996. After the formal approval process was completed, the program went into effect on March 28, 1997.

1.2 Indiana Program Requirements

In order to allow time to develop an adequately protective program, the Indiana WHPP has set up a two-phase process for implementation of management measures a PWSS will undertake to minimize the risk of contamination.

Phase I consists of wellhead protection area (WHPA) delineation, preparing a potential contaminant source inventory, outlining what management measures will be taken or considered for the WHPA, and contingency planning for contamination events. Phase I submittal time frames vary with the size of the PWSS. The City of Lawrenceburg is currently in the "medium" size category, meaning more than 3,300 but less than 50,000 service connections. IDEM has indicated that wellhead protection planning for new wellfields should begin within one year of the wellfield coming on-line.

In Phase II of the WHPP, a community water supplier is required to document the implementation of management measures proposed in Phase I, as well as any changes to the WHPA delineation. Medium PWSSs are required to submit Phase II materials within seven years of IDEM's approval of the Phase I submittal. Subsequently, Phase II materials are required to be submitted every five years after the previous approval date.

1.3 Purpose of This Report

This Report summarizes the hydrogeologic investigation and data collection necessary to characterize the aquifer used by the new Lawrenceburg wellfield. This includes maps, a cross section, and other data required by IDEM to support the WHPA delineation. The data was used to design a groundwater flow model that delineated the area of the aquifer within which groundwater will take 5 years or less to flow to one of the production wells ("5 year time of travel"). Five years is the minimum delineation travel time required by IDEM. The WHPA is depicted in relation to the wellfield and surrounding area.

2.0 DESCRIPTION AND LOCATION OF WELLFIELDS

The City of Lawrenceburg is located in eastern Dearborn County, Indiana. The new Lawrenceburg wellfield utilizes four production wells screened in the alluvial sand and gravel deposit along the Ohio River (in Township 5 North, Range 1 West, Sections 10, 11 and 15). The wells were installed in 2006 to replace the old wellfield located in downtown Lawrenceburg. The three primary wells (PW #1, PW #2, and PW #3) are located at the north edge of the Lawrenceburg Fairgrounds, near where the old Schenley wells were located. A fourth (backup) well, PW #4, is located near Tanners Creek and Highway 50.

The locations of the Lawrenceburg's new wells are shown on Figure 1. Additional high capacity wells (as defined in IC 14-25-7) in the vicinity of the Lawrenceburg wellfield include the Pernod Ricard USA (formerly J.E. Seagram & Sons) well nos. 12, 14, 16, 17, 18 and the Ranney collector well; the three Greendale municipal wells; and the Pri-Pak well (former Schenley well #14). The nearest of these wells is the Pri-Pak well, approximately 520 feet east of Lawrenceburg well #1. The Pernod wells are approximately 2,000 to 4,000 feet to the south. Greendale's wells are approximately 2,000 feet to the north.

High capacity water use records on file at the Indiana Department of Natural Resources, Division of Water (IDNR, 2006) indicate that from 2001 through 2005, yearly production at the Lawrenceburg wellfield varied between 298 and 348 million gallons, averaging 314 million gallons. This amount is equivalent to a daily use of 860,000 gallons. For 2005, the total was approximately 298 million gallons, for a daily average of 816,000 gallons. Table 1 shows production well data for all 14 high capacity wells in the area.

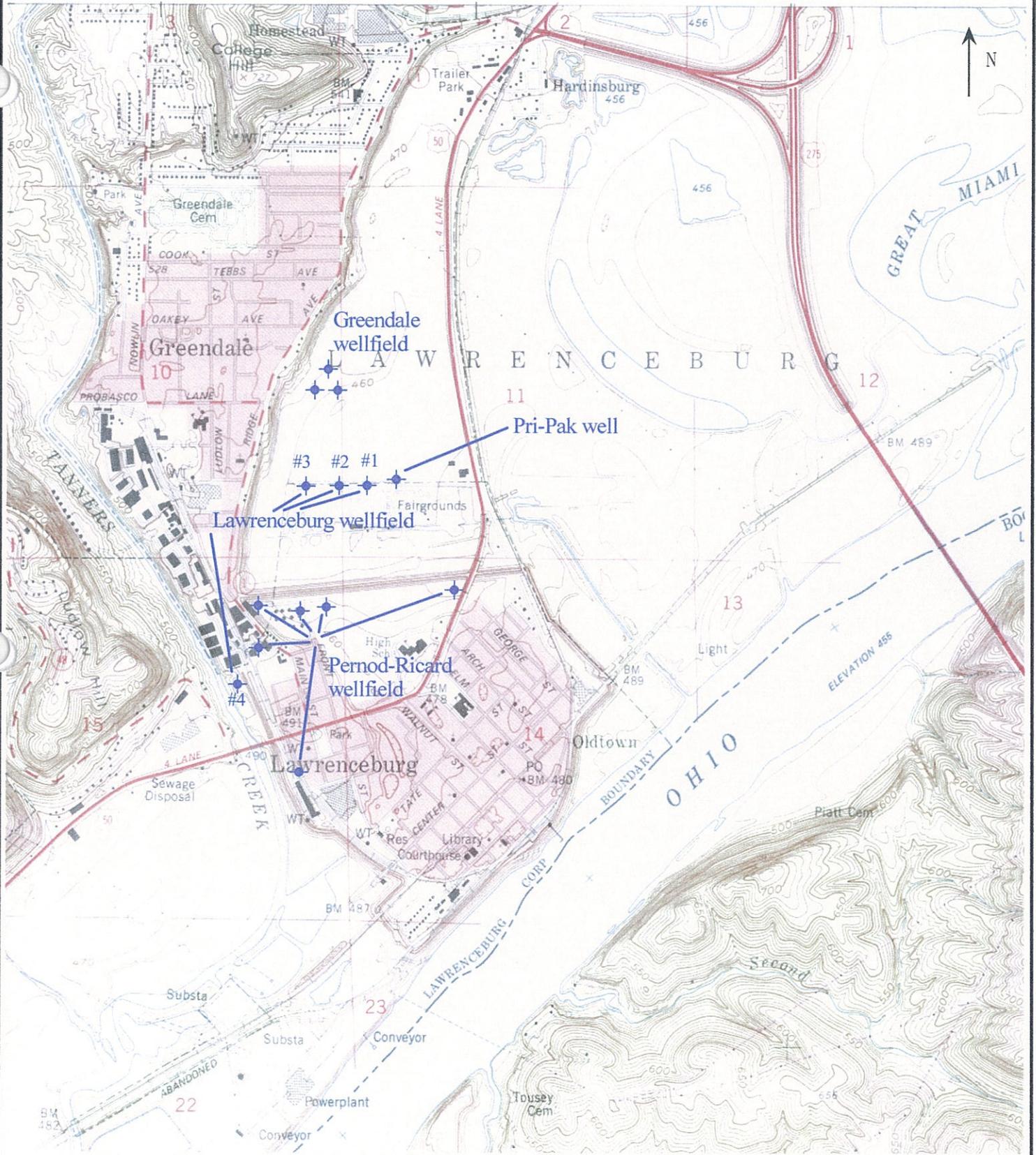
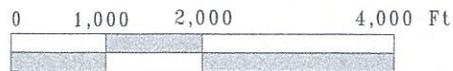


Figure 1. Wellfield location map

SCALE: 1" = 2,000'



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TABLE 1

WELLFIELD PRODUCTION, 2001-2005
 (in millions of gallons per year)

Well	2001	2002	2003	2004	2005	Average
Greendale:						
#1	203.7	204.3	150.7	212.8	209.3	196.2
#2	146.2	190.7	140.2	36.0	78.5	118.3
#3	<u>38.6</u>	<u>40.2</u>	<u>65.0</u>	<u>98.3</u>	<u>87.8</u>	<u>66.0</u>
Total	388.5	435.2	355.9	347.1	375.6	380.5
Lawrenceburg:						
Total	317.8	303.2	303.5	347.7	298.4	314.1
Pri Pak:						
Total	N/A	15.9	15.3	16.4	25.8	18.4
Pernod Ricard:						
Ranney Well	801.1	814.2	900.4	1221.1	1228.6	993.1
#12	401.0	365.3	231.0	308.3	281.1	317.3
#14	41.7	52.2	16.0	66.3	118.3	58.9
#16	51.8	48.2	30.8	22.6	39.8	38.6
#17	442.4	437.9	755.0	548.3	617.8	560.3
#18	<u>0.1</u>	<u>0.7</u>	<u>0.5</u>	<u>0.8</u>	<u>10.1</u>	<u>2.4</u>
Total	1738.1	1718.5	1933.7	2167.4	2295.7	1970.6

3.0 AREA GEOLOGY

Geologic maps of the area (Wayne, 1963; Gray and others, 1972; and Gray, 1989) show that the Lawrenceburg-Greendale area lies over outwash and alluvium created by glacial melt waters and more recent river deposits. The area is approximately 13 miles south of the farthest advance of the Wisconsin-age (most recent) glaciation. However, the area of the wellfield was overridden by earlier glaciers that left behind till deposits which have since been eroded. During glaciation, sand and gravel were deposited by glacial melt waters passing through the Ohio River valley.

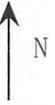
Glacial deposits in the area are all of Quaternary age (0-2 million years old), and belong to the Jessup and Atherton Formations. Post-glacial deposits are included in the Martinsville Formation. Beneath the Quaternary deposits are shale and carbonate bedrock of Ordovician age. Figure 2 shows the geology in the Lawrenceburg-Greendale area (from the map by Gray and others, 1972).

3.1 Bedrock

The Lawrenceburg-Greendale area lies near the crest of the Cincinnati Arch, a regional bedrock feature that extends from southwestern Ohio to northwestern Indiana.

Locally, bedrock belongs to the Kope and Dillsboro Formations. The Kope Formation consists primarily of brownish-gray shale (Gray and others, 1972), with minor beds of limestone, and ranges in thickness from 200-400 feet. This formation is not exposed at the surface in the area of the wellfields, having been buried by outwash and alluvium in the Ohio River valley. Drilling log data from the wellfields indicates that shale was encountered at the bottom of some of the borings. The Dillsboro Formation consists of fossiliferous limestone and calcareous shale (Brown and Lineback, 1966; and Shaver and others, 1986). It is present on the uplands above the wellfields (from the geologic map of Gray and others, 1987). There are no faults in the Lawrenceburg-Greendale area (Blakey and Varma, 1976).

Figure 3 is a map that illustrates the bedrock topographic surface in the vicinity of the wellfields based on well log data. The lowest elevations on the bedrock topographic map reflect where the ancient Ohio River valley was scoured out by glacial melt waters with a heavy and coarse sediment load that was deposited over the bedrock surface. The deepest part of the pre-glacial bedrock valley is a relatively narrow channel (geologic map of Swadley, 1972) that



KEY

-  Qsa, Silt, sand, and gravel. Mostly alluvium, Martinsville Formation.
-  Qcl, Clay, silt, and sand. Lake deposits of Atherton Formation.
-  Qgv, Gravel, sand, and silt. Valley-train deposits from glacial meltwaters, Atherton Formation.
-  Qti, Till (pre-Wisconsin), Jessup Formation.
-  Top of Kope Formation
-  O, Ordovician Rocks

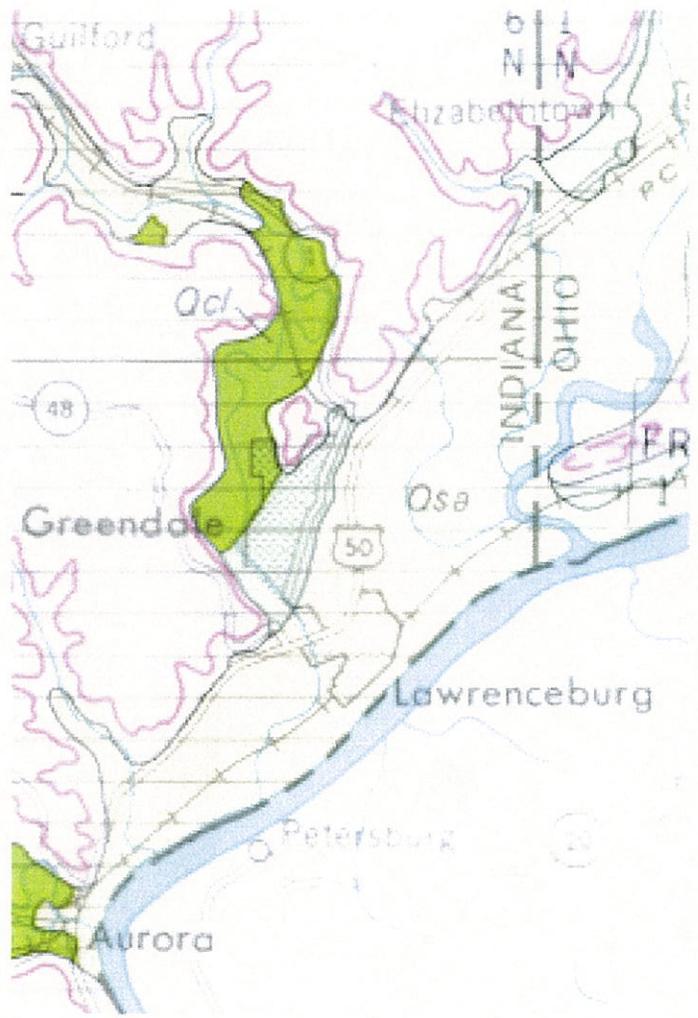


Figure 2. Geologic map of the Lawrenceburg-Greendale area, from the Geologic Map for the 1 x 2 degree Cincinnati Quadrangle, Indiana and Ohio, Showing Bedrock and Unconsolidated Deposits (Gray and others, 1972)

SCALE: 1" = 8,000'

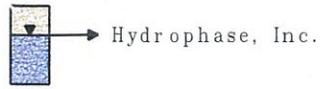
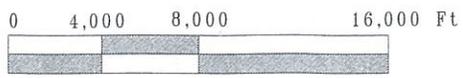
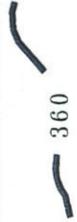




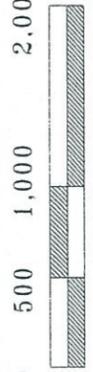
Figure 3. Bedrock topographic map

LEGEND:



Bedrock elevation 360

SCALE: 1" = 1,000'



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meanders across the valley floor, and is also characterized by buried bedrock valley hills, benches, and cusps (Gallaher and Price, 1966).

3.2 Jessup Formation

The Jessup Formation represents pre-Wisconsin age glacial deposits in Indiana. It consists mostly of till (poorly layered mixed material including clay, silt, sand and gravel deposited directly beneath glaciers). The Jessup is extremely variable in thickness because it is bounded above and below by erosional surfaces (Wayne, 1963). The formation also includes thin beds of lenses of gravel, sand, silt, clay, peat and marl (Schneider and Gray, 1966). The Jessup usually rests directly on bedrock, but in a few locations it is underlain by a tongue of the Atherton Formation (Wayne, 1963). In northwestern Dearborn County, it caps some of the higher topography, but has been completely eroded in the area of the wellfields.

3.3 Atherton Formation



The Atherton Formation spans the entire Quaternary age, and consists of coarse to fine grained well sorted sediments that were deposited on a local scale by glacial processes (Wayne, 1963). These include glacial outwash (sand and gravel deposited by glacial meltwater streams), lake sediments, dune sediments (generally derived from, and overlying the outwash material), and loess (consisting of silt deposited by the wind, and derived from glacial deposits). The Ohio River Valley aquifer, with its gravelly glacial outwash, is part of this formation.

Extensive hydrogeologic studies have been conducted along the Ohio River valley (Walker, 1957; Gallaher and Price, 1966; Price, 1964; and Webb, 1970). The valley fill deposits can generally be described as fine-grained alluvium on top, underlain by coarse outwash deposits (Walker, 1957). Local well logs record the presence of this fine-grained layer above the aquifer. Initially, as much as 180 feet of valley fill sediments had been present in the valley, as indicated by remnant gravel/alluvial deposits at higher elevations (Gallaher and Price, 1966), such as the terrace beneath Greendale (the light green mapped area in Figure 2). The terrace landforms were created after the last glacial retreat, as the Ohio River downcut into the outwash. Up to 140 feet of outwash and alluvium are still present in some areas. Outwash interfingers with clay and silt layers deposited in lakes that were created when the outwash blocked tributary discharge (Webb, 1970; the dark green area in Figure 2). Outwash deposits are exceptionally coarse near and downstream from Cincinnati, because this area was nearest to the edge of the ice sheet (Walker, 1957).

3.4 Martinsville Formation

Most of this formation is of Recent (post-glacial) age, but some of the basal layers date to the Wisconsin glaciation. The Recent section of the Martinsville consists of two types of deposits: alluvial sediments of non-glacial origin that have been deposited in modern flood plains along the major drainages; and peat, marl, clay and silt, which have been deposited in sloughs, lake basins or bogs. This formation varies in thickness from a few inches up to 30 feet near rivers, and is still undergoing deposition (Wayne, 1963). It caps the aquifer along the Ohio River (the yellow "Qsa" unit on Figure 2).

4.0 WELLHEAD PROTECTION AREA DELINEATION

The new Lawrenceburg wellfield utilizes groundwater from the Ohio River Valley Aquifer. Wells in this aquifer are capable of producing 1,000 gpm or more. Wells installed in bedrock or other unconsolidated deposits from outside the Ohio River flood plain generally produce less than 10 gpm (Woodfield and Fenelon, 1994).

4.1 Aquifer Lithologic Description

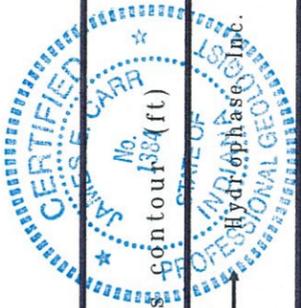
Drilling logs from wells in the area of Lawrenceburg indicate thicknesses of unconsolidated sediments generally to be at least 70 feet thick. They are over 100 feet thick in some places in the floodplain, as well as in the terrace beneath the residential section of Greendale. The uppermost sediments are usually fine-grained alluvium (clay, silt, and sand) deposited in the flood plain. The alluvium varies in thickness (generally between 20 and 40 feet), and often contains layers of sand and/or gravel. This layer affords some level of protection from potential surface contamination. Between the alluvium and bedrock lies the outwash aquifer utilized by the wellfields. The aquifer is described as containing material ranging in size from fine sand to coarse gravel.

Figure 4 is an interpretive isopach map, showing the saturated aquifer thickness in the Lawrenceburg-Greendale area. Because many wells do not completely penetrate the aquifer, data on total thickness is scarce outside the area of high capacity wells. Little subsurface information of any kind is available for the northeastern quarter of the mapped area and for the area north of Lane Street in Greendale.

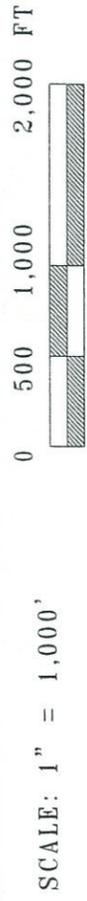
The local hydrogeology is illustrated in a cross section, based on local drilling logs and the USGS Lawrenceburg Quadrangle topographic map. The cross section was constructed perpendicular to the axis of the valley, along the route shown on Figure 5. Cross section A-B (Figure 6) extends west to east, beginning on the bedrock slope on the west flank of the valley and continuing across Tanners Creek, Greendale, the new Lawrenceburg wellfield, the west levee, the Pernod Ranney well, the edge of downtown Lawrenceburg, the east levee, and to the Kentucky side of the Ohio River. Drilling logs for the Old Quaker Plant and the Pierson Hollowell site were used to estimate the geology in the southwest corner of Greendale. Logs used for the cross section are attached as Appendix A.



Figure 4. Aquifer thickness map



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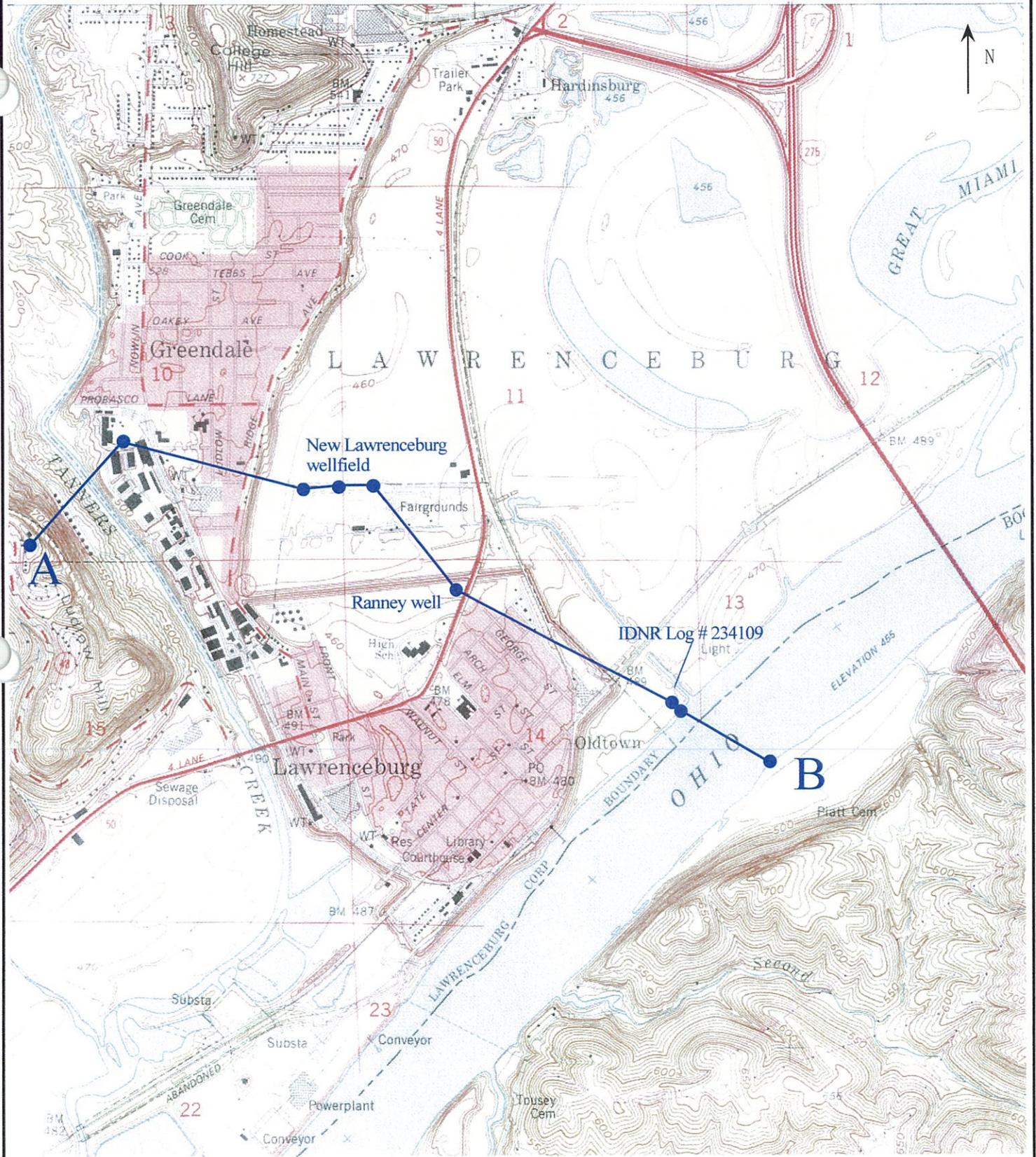
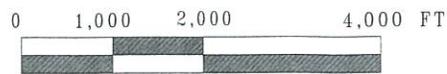


Figure 5. Line of Cross Section A-B

SCALE: 1" = 2,000'



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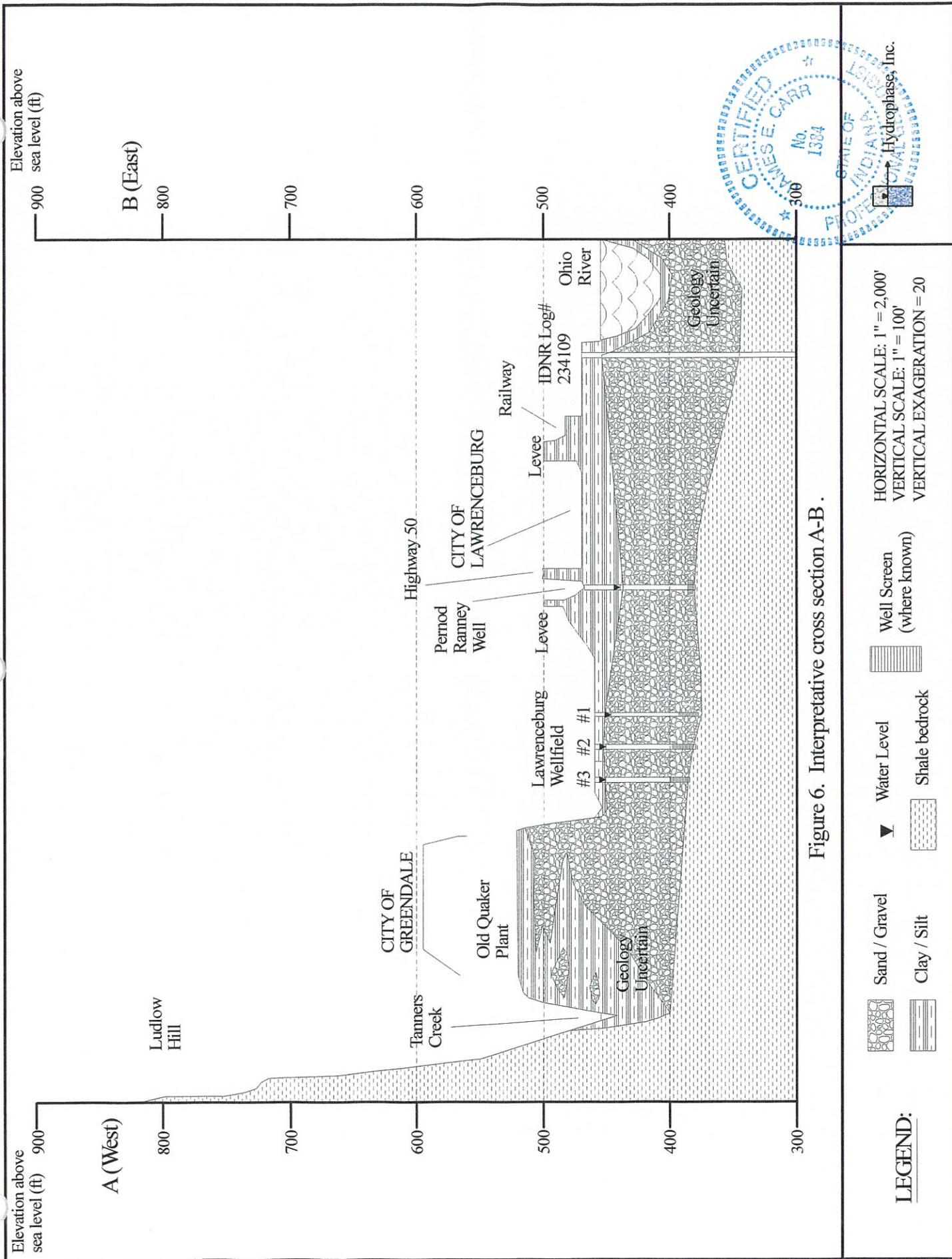


Figure 6. Interpretative cross section A-B.

4.2 Aquifer Hydraulics

Groundwater levels vary seasonally, with river stage, and with distance from the valley walls. The *regional* hydraulic gradient in the Ohio River Valley aquifer will be parallel to the surface water gradient. However, because of the numerous dams that have been constructed along the Ohio River, the water table is virtually flat in the area of the wellfield, in the absence of pumping. A generalized potentiometric surface map (Figure 7) was constructed to depict the regional gradient parallel to the river, using as a reference point the 455 foot elevation datum indicated on the USGS topographic map.

Static water levels vary from less than 10 feet to over 30 feet below grade, as reported on well logs. This data, combined with geologic descriptions, indicates that both confined and unconfined conditions occur in the aquifer. The overlying alluvium consists of a mix of sand, silt and clay and although it provides some protection against downward seepage of contaminants, it cannot be considered a truly “impervious” cap for the aquifer below. Therefore, at many locations where the aquifer appears to be confined, recharge through the alluvium creates “unconfined” conditions. At some wells, although groundwater is under confined conditions, it is only a few feet above the top of the aquifer. When natural water level fluctuations or significant pumping occur, water levels are drawn below the formation top, with a return to unconfined conditions.

True confined conditions are more likely to occur at the margins of the aquifer toward the upland in Greendale, where the aquifer is deeper, and the confining layer is thicker. Confined conditions will also occur when the river is at a high stage.

Hydraulic conductivity (K) is the rate at which water can move through a permeable medium. It is defined by: $K = T/b$, where T is the transmissivity, and b is the aquifer thickness. Transmissivity was determined from pump tests conducted by HC Nutting (2006a and 2006b) for the City of Lawrenceburg and for the PSEG facility (URS, 2000). The HC Nutting test produced an estimate for aquifer hydraulic conductivity of 500 ft/day for the fairgrounds wellfield, and 836 ft/day for PW #4 near Tanners Creek. A pump test conducted for PSEG (URS, 2000) produced a value of 483 ft/day for the area directly south of Tanners Creek. The numbers derived from these tests are in the mid to upper range for sand and gravel outwash aquifers.

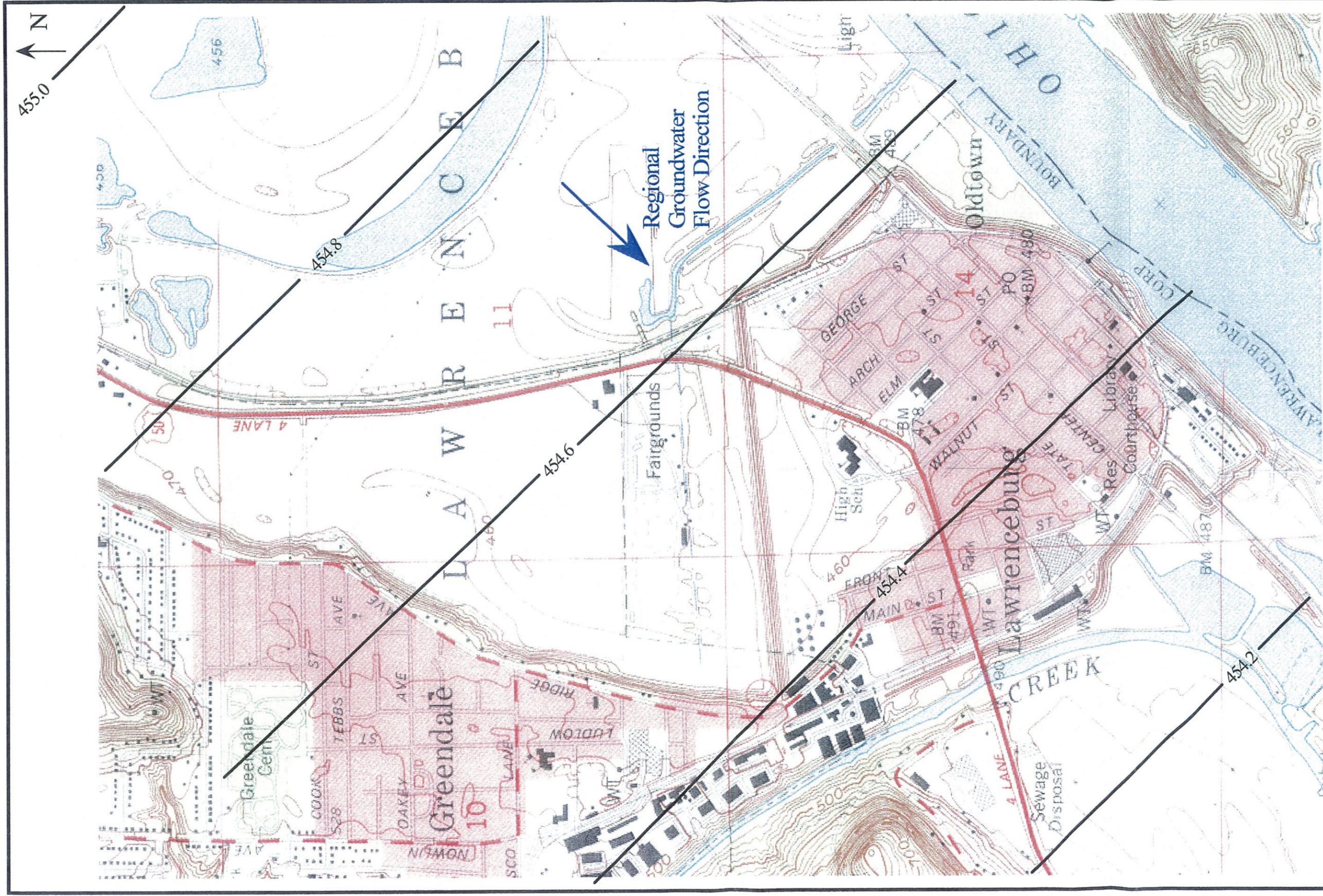


Figure 7. Regional groundwater flow map

LEGEND:

Groundwater elevation contour (ft)

SCALE: 1" = 1,000'



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4.3 Surface Water and Recharge

The Ohio River and groundwater are hydraulically connected. The coarse grained outwash is continuous across the valley, but the river cuts the finer-grained overlying alluvium (Walker, 1957), making it easier to recharge the aquifer directly. Recharge will also enter the aquifer through lakes in the floodplain and along Tanners Creek, although the pump test on PW#4 near Tanners Creek indicated no apparent connection in the vicinity of that well during a 24-hour period (HC Nutting, 2006b).

Rainfall infiltration and runoff from higher ground onto the Ohio River floodplain contributes additional recharge. The amount of recharge fluctuates seasonally, being less in the summer due to greater evaporation and transpiration, and greater in the winter and early spring due to flooding and snow melt.

4.4 Hydrogeology of Other Formations

A few wells have been installed outside the flood plain, in sand/gravel units within tributary valley sediments, and in bedrock. The Ohio River Valley aquifer is so prolific however, that exploration for high capacity wells outside the flood plain is unnecessary. For all practical purposes therefore, no significant hydraulic connection exists between the underlying shale bedrock and the outwash aquifer.

4.5 WHPA Delineation Method

With fourteen (14) high capacity wells pumping from the Ohio River Aquifer, a numerical groundwater flow model was used to delineate a wellhead protection area for the Lawrenceburg wellfield. A numerical model was preferred over the simpler semi-analytical “WHPA” model because variations in the aquifer properties can more easily be taken into account, and non straight-line aquifer boundaries can be more accurately represented. Allowance for such variances make the model more adaptable to site specific conditions, and more accurate in predicting groundwater flow where numerous wells are involved. Numerical models also have superior input/output processors and graphical packages. James E. Carr, LPG #1384, of Hydrophase, Inc., prepared this delineation for the City of Lawrenceburg.

The finite-difference numerical model ASM (Aquifer Simulation Model) 6.0 for Windows was used to calculate the five-year time-of-travel wellhead protection area (WHPA)

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delineation. This model conforms to one of the approved methods for WHPA delineation, per the State of Indiana Wellhead Protection Rule, 327 IAC 8-4.1-5, (b), (2). ASM is a refinement (van der Heijde, 1996) of the PLASM model (Prickett and Lonquist, 1971), which has been widely documented.

IDEM has approved eleven other WHPA delineations in Indiana that were prepared by Hydrophase, Inc., using ASM 5.0 (in Franklin, Dearborn, Madison, Morgan and Putnam counties). The University of Wisconsin, nationally recognized as a leading school in hydrology, uses ASM along with WHPA and WhAEM as instructional tools in their groundwater modeling courses (Bradbury, 1998).

4.6 Model Configuration

Finite difference models are laid out in a grid pattern. The size of the grid and the size of each square (or cell) depends on the site-specific model requirements. All cells sizes were 200 x 200 feet. In this model, the grid's dimensions are 11,000 x 15,000 feet, with the long boundary oriented northeast-southwest. This represents an area of approximately six (6) square miles, including parts of Sections 1, 2, 3, 10, 11, 12, 14, 15, 22, and 28, in Township 5 North, Range 1 West. The model boundaries were oriented in this direction because it was parallel to the Ohio River. This makes it easier to set up the groundwater flow simulation and enter groundwater elevation data. Figure 8 outlines the modeled area.

“Constant heads” were used to simulate the hydraulic boundary with the Ohio River. At constant head boundaries, groundwater levels are not allowed to fluctuate during the execution of the model, and in effect serve as recharge or discharge points.

“Inactive cells” were entered into the model to represent the upland areas that are underlain by bedrock or other poorly conductive strata. This was necessary so that areas where the aquifer was absent would not contribute water to the modeled system. These areas are illustrated in Figure 8.

Hydraulic characteristics input to the model included aquifer type (unconfined), aquifer hydraulic conductivity, porosity, bottom and top elevations, recharge, groundwater elevations, and pumping rates.

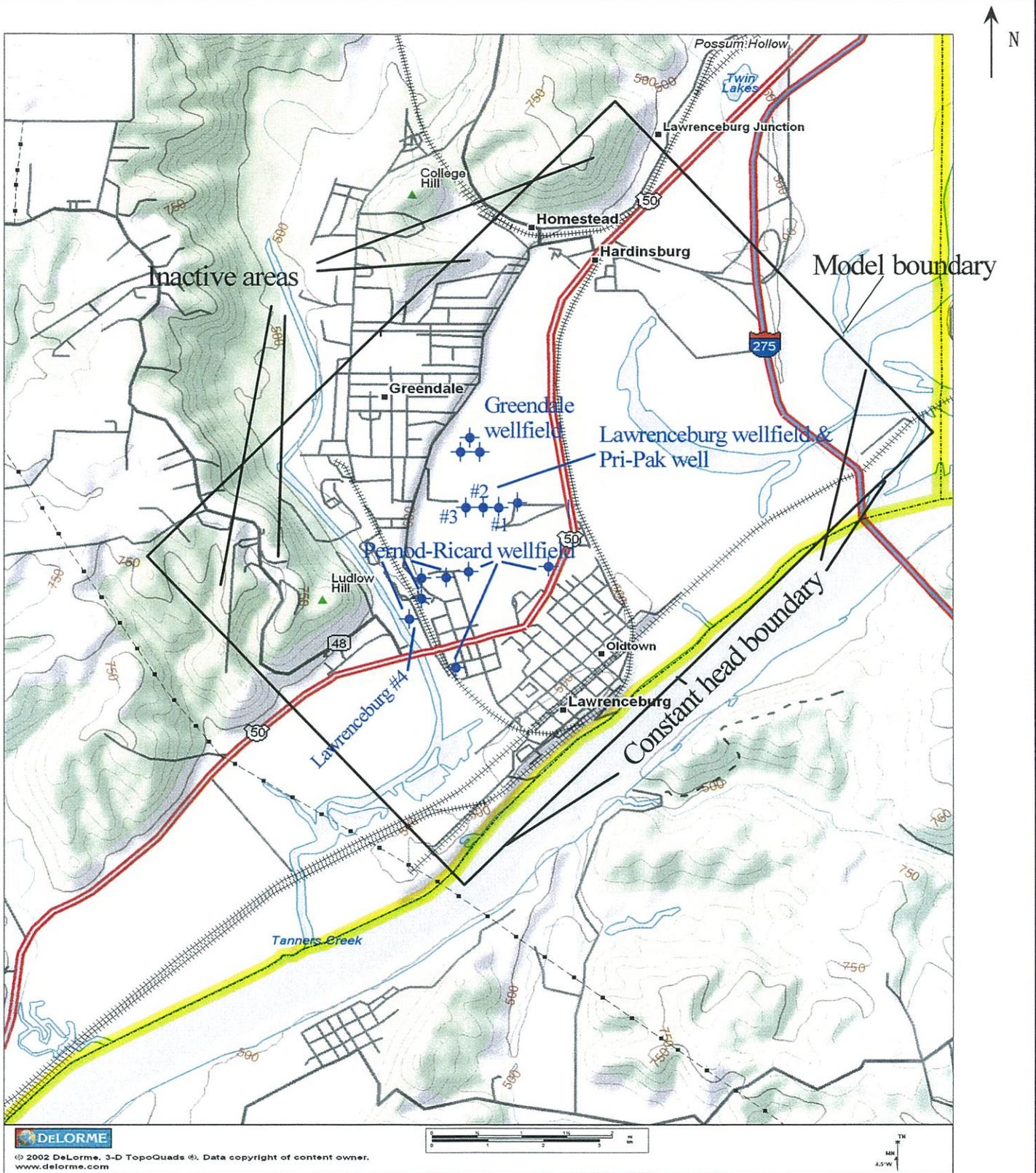
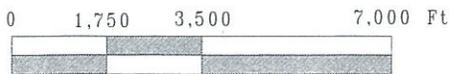


Figure 8. Model area

SCALE: 1" = 3,500'



Hydrophase, Inc.

Hydraulic conductivity was initially assigned a value of 606 ft/day (0.007 ft/sec). This was an average of calculated values from pump tests at the new Lawrenceburg wellfield and the tests conducted for PSEG in 2000.

The aquifer was assigned a porosity value of 0.25, a moderately conservative value for sand and gravel aquifers. The aquifer bottom was varied between 350 and 400 feet, based on interpretation of well log data. These values were assigned in strips parallel to the river, with elevation increasing as the distance from the river increased.

The aquifer top was arbitrarily set at 455 feet. This elevation is a good approximation of the aquifer top throughout much of the model area. Model test runs indicated that the output was not very sensitive to reasonable variations in the top of the aquifer.

Recharge to aquifers in groundwater models varies with the amount and type of overburden present, and the amount of runoff expected. Average recharge was assigned a value of 12 inches per year across the model area because of seepage from Tanners Creek, lakes, and ponding after rainfall events allows for more infiltration through the less permeable alluvium than would occur where significant slopes are present. Groundwater models by the U.S. Geological Survey (Arihood, 1983; Lapham, 1981; Bailey and Imbrigiotta, 1982; Meyer and others, 1975) assigned similar values for recharge through floodplain alluvium.

The flow gradient along the Ohio River was calculated by extrapolating between the pool elevations between the nearest downstream (Captain Anthony Meldahl) and upstream (Markland) dams (data from the US Army Corps of Engineers, 2004). The drop between these two dams was 30 feet over 95.3 miles, as measured along the course of the Ohio River. The gradient between these two points is 0.00006 ft/ft. This is a very “flat” gradient, but typical for large rivers. Because the USGS Lawrenceburg topographic map indicates a river elevation of 455 feet, this value was assigned to the upgradient end of the model. The model area is 15,000 feet long, and a gradient of 0.00006 ft/ft results in only a 0.9 foot drop across the length of the model. Therefore, initial groundwater elevations (heads) were assigned values between 455.0 feet at the upgradient model boundary and 454.1 feet at the downgradient end. The flow direction was South 46 degrees West, parallel to the regional groundwater flow direction, as discussed in Section 4.2.

To account for future growth, the Lawrenceburg wellfield was assigned a daily total of 990,000 gallons per day. This amount is fifteen (15) percent above the average from the years

2001-2005. This total was distributed as 30 percent to each of the fairgrounds wells and 10 percent to the backup well near Tanners Creek.

The model includes the simplifying assumptions of a homogeneous aquifer (within the zones defined as having the same thickness and hydraulic conductivity), steady and uniform ambient groundwater flow, completely penetrating wells, and continuous pumping. When pumping is simulated as “continuous”, variations in capture zones that would arise from seasonal pumping changes, well maintenance, cycling or other factors are not taken into account. The model represents pumping simply as an average of whatever variations occur. As a conservative assumption, recharge or leakage to the aquifer from lakes was not represented. Simulating leakage from lakes may cause flow lines to stop at those locations when in fact they may continue beyond them.

The model was not calibrated. This has typically not been done for WHPA models for small to medium size utilities in Indiana due to time and budgetary constraints. Real-world groundwater flow systems are vastly more complex than can be represented in a model, constructed within these constraints. However, the assumptions and data input to the model are based on a thorough review of available hydrogeological data for the area around the new Lawrenceburg wellfield. Initial model input are summarized in Table 2.

TABLE 2

**The City of Lawrenceburg
Wellhead Protection Area Delineation
Initial Model Input**

Aquifer Parameter	Value	Source
Aquifer Type	Unconfined	Drilling logs
Hydraulic conductivity	606 feet/day	Average based on pump tests on the Lawrenceburg wells conducted by HC Nutting, and URS tests conducted for PSEG
Porosity	0.25	Moderately conservative value for sand and gravel aquifers
Aquifer bottom	Between 350 and 400 feet	Drilling logs
Aquifer top	455 feet	An average elevation based on drilling logs
Recharge	12 in/year	Based on estimates of recharge through river bottom deposits from USGS aquifer models
Groundwater level range (NE to SW model boundaries)	455.0 to 454.1 feet	River elevation data from the US Army Corps of Engineers
Pumping rates	(rounded to the nearest 1,000 gallons per day)	
Lawrenceburg #1	297,000	Using the average total production from 2001-2005 (IDNR records) plus 15%, split among the three primary wells and one backup well: 30% to each primary well and 10% to the backup well.
Lawrenceburg #2	297,000	
Lawrenceburg #3	297,000	
Lawrenceburg #4	97,000	
Pri-Pak	58,000	The average 2002-5 production plus 15%
Greendale #1	620,000	The average 2001-5 production plus 15% for each well
Greendale #2	375,000	
Greendale #3	207,000	
Pernod Ricard – Ranney well	3,367,000	The most recent (2005) IDNR water use records were used because the Ranney collector well's share of the total changed significantly in 2004, and using the more recent data is believed to better reflect future production
Pernod Ricard #12	769,000	
Pernod Ricard #14	323,000	
Pernod Ricard #16	110,000	
Pernod Ricard #17	1,693,000	
Pernod Ricard #18	26,000	

4.7 Five-Year Time-of-Travel Simulation

The model was used to predict groundwater flow pathlines to the wells along which captured water would travel over a five-year period. Five years is the minimum time required to determine the WHPA. The Pri-Pak capture zone was included because that well is owned by Lawrenceburg and its capture zone is tightly embedded within that of Lawrenceburg's.

Figure 9 shows the combined five year time-of-travel capture zone for the new Lawrenceburg wells 1-3 together with the Pri Pak well. This part of the WHPA is approximately one-third square mile. Most of this area is outside the city limits of Lawrenceburg. This is the result of the greater levels of pumping from Pernod Ricard to the south. The WHPA for PW #4 by Tanners Creek is much smaller, and is embedded within the capture zones of the Pernod Ricard wells. Model output data are included in Appendix B.

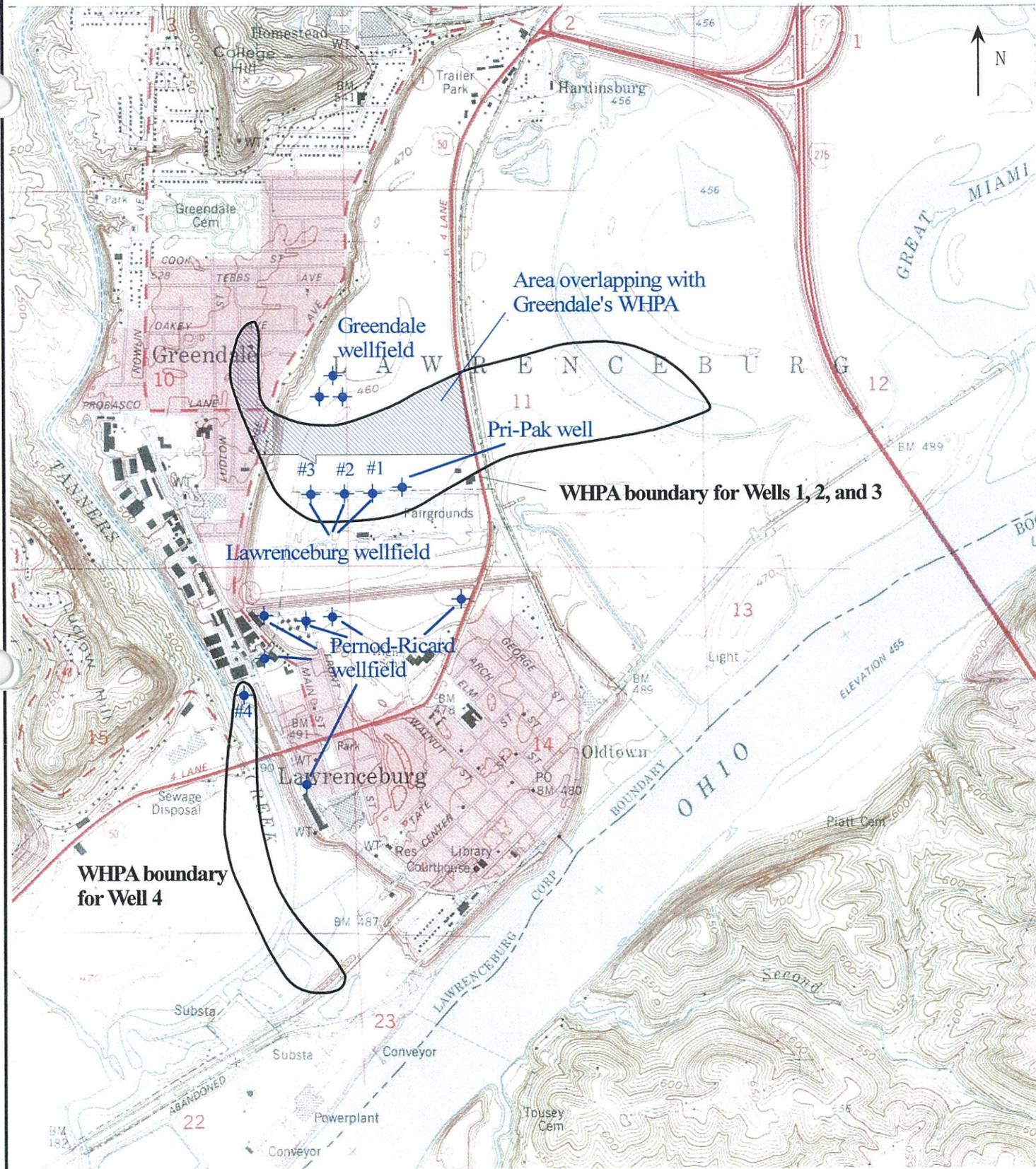
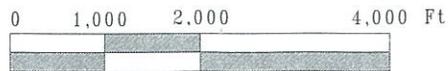


Figure 9. Wellhead Protection Area for Lawrenceburg

SCALE: 1" = 2,000'



Hydrophase, Inc.

4.8 Effects of Input Parameter Variations

Capture zone analysis is required by IDEM, and was performed with additional model runs. These runs are summarized on Table 3. Output diagrams from these additional scenarios are included in Appendix B. Descriptions of changes for each run are given below.

1) This was the initial model input.

2) Hydraulic conductivity was increased from 0.007 ft/sec to 0.02 ft/sec. Running the model at the highest hydraulic conductivity calculated from a recent pump test (836 ft/day, or about 0.01 ft/sec for PW#4 along Tanners Creek) did not appreciably change the capture zone. The result of using the 0.02 value is that the relative importance of hydraulic conductivity increased (versus the river) and the capture zones for all the pumping centers expanded to areas farther from the river, particularly to the north and northeast. The capture zone for PW #4 shifted slightly toward the river as a result.

3) Hydraulic conductivity was decreased from 0.007 ft/sec to 0.0025 ft/sec. Running the model at the lowest hydraulic conductivity calculated from a recent pump test (483 ft/day, or about 0.0056 ft/sec for the URS pump test for PSEG in 2000) did not appreciably change the capture zone. The result of using the 0.0025 value is that the capture zone for wells #1, #2, and #3 increased in size to account for a less conductive aquifer, needing to pull in water from a larger area to meet wellfield demand. The capture zone for PW #4 shifted slightly away from the river as a result, but did not change appreciably in size.

4) Porosity was increased by 25 percent, from 0.25 to 0.3125. This decreases groundwater velocity, and shrinks the capture zones for both PWs #1-3 and PW #4.

5) Porosity was decreased by 25 percent, from 0.25 to 0.20. This increases groundwater velocity, and expands the capture zones for both PWs #1-3 and PW #4.

6) Recharge was increased by one-third, from 12 inches per year to 16 inches. The model was not very sensitive to recharge adjustments of this scale. The capture zone decreased slightly.

7) Recharge was decreased by one-third, from 12 inches per year to 8 inches. The model was not very sensitive to recharge adjustments of this scale. The capture zone increased slightly.

TABLE 3

**The City of Lawrenceburg
Wellhead Protection Area Delineation
Model Input Variations**

Model run number	Changes from initial conditions
1	The initial run. No changes.
2	The capture zone rotated to the east/northeast and expanded slightly.
3	The capture zone expanded somewhat in the direction of flow.
4	The capture zone was reduced somewhat in the direction of flow.
5	The capture zone was expanded somewhat in the direction of flow.
6	The capture zone was slightly reduced in the direction of flow.
7	The capture zone was slightly increased in the direction of flow.

Because model runs # 2-7 above represent less likely hydraulic conditions, the 5 year time-of-travel capture zone calculated by the initial model was recommended as the wellhead protection area (WHPA). This capture zone was approved by IDEM on February 5, 2008. The entire Wellhead Protection Plan was approved on April 17, 2008. Approval letters are attached as Appendix I. As with any groundwater flow model, capture zones are approximate and cannot be predicted precisely and with certainty because of the multiple and complex variables involved in the calculations, and because data is limited to areas where wells have been drilled.

5.0 POTENTIAL CONTAMINANT SOURCE INVENTORY

Land use within the northern part of the WHPA (the area captured by Production Wells #1, 2, and 3) includes the fairgrounds, an industrial park, a small residential part of Greendale, some property along US 50, and a wildlife refuge east of Highway 50. The approximate percentages of different land use for this part of the WHPA are:

Oxbow Wildlife Refuge	40%
Greendale Industrial Park (including the strip on the west side of Highway 50)	40%
Fairgrounds	10%
Greendale - Residential	10%

Land use within the smaller, southern part of the WHPA (the area captured by Production Well #4) is occupied by a business (“B”) zoned area and a general manufacturing & industrial zoned (“GM”) area (most of which is in the floodplain). The approximate percentages of different land use for this part of the WHPA are:

Undeveloped floodplain (GM)	50%
Commercial properties (B)	20%
Tanners Creek & small lakes (GM)	20%
Area by Well #4 east of Tanners Creek (GM)	5%
Area by railway (GM)	5%

5.1 Database Search

A database search was conducted to produce an inventory of potential contaminant sources. FirstSearch Technology Corp. was contracted to perform the search, which consisted of a review of the federal and state databases shown below. Pages from the First Search report pertaining to the two sites found within the WHPA are included in Appendix C.

Federal:

- 1) NPL (National Priorities List)
- 2) CERCLIS (Comprehensive Environmental Response, Compensation & Liability Information System) – Current and potential Superfund sites

- 
- 3) CERCLIS – NFRAP (Not judged to be a potential NPL site)
 - 4) RCRA TSD (Resource Conservation and Recovery Information System - Treatment, Storage, and Disposal Facilities)
 - 5) RCRA – COR (RCRA facilities with reported violations and subject to corrective action)
 - 6) RCRA Generator (RCRA Information System – Large, Small and conditionally exempt generators)
 - 7) RCRA – NLR (RCRA Sites no longer reporting)
 - 8) ERNS (Emergency Response Notification System)
 - 9) NPDES (National Pollutant Discharge Elimination System) Permits
 - 10) FINDS (Facility Index System)
 - 11) TRIS (Toxic Release Inventory System)
 - 12) Nuclear Permits
 - 13) HMIRS (U.S. DOT Incidents)
 - 14) NCDB (National Compliance Database System)
 - 15) Other
 - 16) PADS (PCB Activity Database System)
 - 17) Radon



State:

- 1) State Sites (Indiana State Cleanup List)
- 2) Spills-1990 (Indiana Spills Database)
- 3) SWL (Indiana Permitted Solid Waste Facilities List)
- 4) Other – This includes primarily the Indiana Right to Know (CRTK) database, and commercial pesticide applicators and restricted-use pesticide dealers
- 5) UST (Indiana Registered Underground Storage Tank List)
- 6) LUST (Indiana Leaking Underground Storage Tank List)
- 7) Brownfield Sites



These databases were reviewed to note any sites within Lawrenceburg's WHPA. The FirstSearch program searched an area within a perimeter that covered both the north and south WHPA segments. Because of the large area searched, many sites were listed, but none were actually shown as being within the WHPA. However, the windshield survey (Section 5.2) indicated that two of the sites were within or at the edge of the WHPA. One site was the Gas Barn at 507 W. Eads Parkway (a Shell Station). The second site was Hagg Ford at 405 Eads Parkway East. Both of these sites are in the LUST database. The release at Hagg Ford was

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reported in 1998, as only affecting the soil, and is listed now as “NFA” (no further action). The Gas Barn was reported in 1994, as affecting both soil and groundwater, and is listed now as “Active”.

5.2 Windshield and Aerial Survey

On April 26, 2007, Hydrophase Inc. conducted a windshield survey to verify the records search and locate any additional potential contaminant sources. Property inspections however are beyond the scope of the windshield survey.

For the WHPA for Wells #1, 2, and 3, the Hagg Ford dealership and service center were noted at the southwest corner of Highway 50 and Rudolph Way. Numerous semi trailers were observed on the Drue Chrisman property directly north of the wells, in Greendale’s industrial park. The Fairgrounds gate to the racetrack area was locked, but from observation of similar sites, previous conversations, and from what could be seen from the outside, it is assumed that during special events small amounts of fuels may be stored on the property and livestock may be sheltered in some of the structures.

For the WHPA for Well #4, the Shell service station (Gas Barn) was noted at the northwest corner of Eads Parkway and Industrial Drive. On the south side of Eads Parkway, across from the Gas Barn, are sites with signage labeled, “Interstate Batteries” and “Waldon Automotive”. A portion of a waste water treatment plant property is within the WHPA. The building that faces Eads Parkway is labeled “South Dearborn Regional Sewer District”. At or just beyond the southern tip of the Well #4 WHPA is a coal storage area, a small lake, and a railroad.

Spills along U.S. Highway 50, Eads Parkway or Ridge Avenue in Greendale also qualify as potential sources of contamination.

5.3 Further Discussions of Potential Sources

Additional information on potential contaminant sources was obtained at the local planning team meeting on April 26, 2007. In the WHPA for Wells #1, 2, and 3, it is believed that the trailers parked on the south end of Drue Chrisman, Inc. property are empty. There may have been at one time an AST or UST at the site to fuel the trucks there. Additional development may occur in the future in the fields north and south of Rudolph Way. However the area that is in the WHPA to the east of Highway 50 is a wildlife refuge, and will not be developed.

In the WHPA for Well #4, most of the land between Tanners Creek and the wastewater treatment facilities is in the floodplain and will not be further developed. The discharge point for wastewater plant effluent is to Tanners Creek, but outside of the WHPA. It is anticipated that the Gas Barn at Eads Parkway and Industrial Drive will be closed within a year or two.

Table 4 lists potential contaminant sources in the WHPA (for all four wells). Figures 10 and 11 are land use maps that show the locations of these potential sources.

TABLE 4

**City of Lawrenceburg
Wellhead Protection Area**

Key to Potential Contaminant Source Maps

Site ID #	Site Name & Location	Site Description	Environmental Permits	Types of Potential Contamination	Site Status
1 (FirstSearch ID # 17)	Hagg Ford 405 Eads Parkway East	Vehicle sales and service facility	LUST ID # 199812590	Petroleum products	Active ("NFA" as a LUST site)
2	Drue Chrisman 775 Rudolph Way	Trucking: motor freight	Unknown	Petroleum products (?)	Active
3	US Hwy 50, (Eads Pkwy), Ridge Dr.	Transportation routes	None	Possible spills	Active
4	Fairgrounds	Recreational, seasonal events	None	Limited fuel storage, possible livestock waste	Periodically Active
5 (FirstSearch ID # 35)	Gas Barn 507 W. Eads	Service station	LUST ID # 199407524	Petroleum products	Active (also "Active" as a LUST site)
6	Waldon Automotive 348 W. Eads	Auto Repair and oil changes	Unknown	Petroleum products	Active
7	Interstate Batteries (next to Waldon)	Auto battery sales (?)	Unknown	Lead, petroleum products (?)	Active (?)
8	Sewer Treatment Plant	Wastewater treatment	NPDES IN0024538	Wastewater	Active
9	Railway	Transportation routes	None	Possible spills	Active

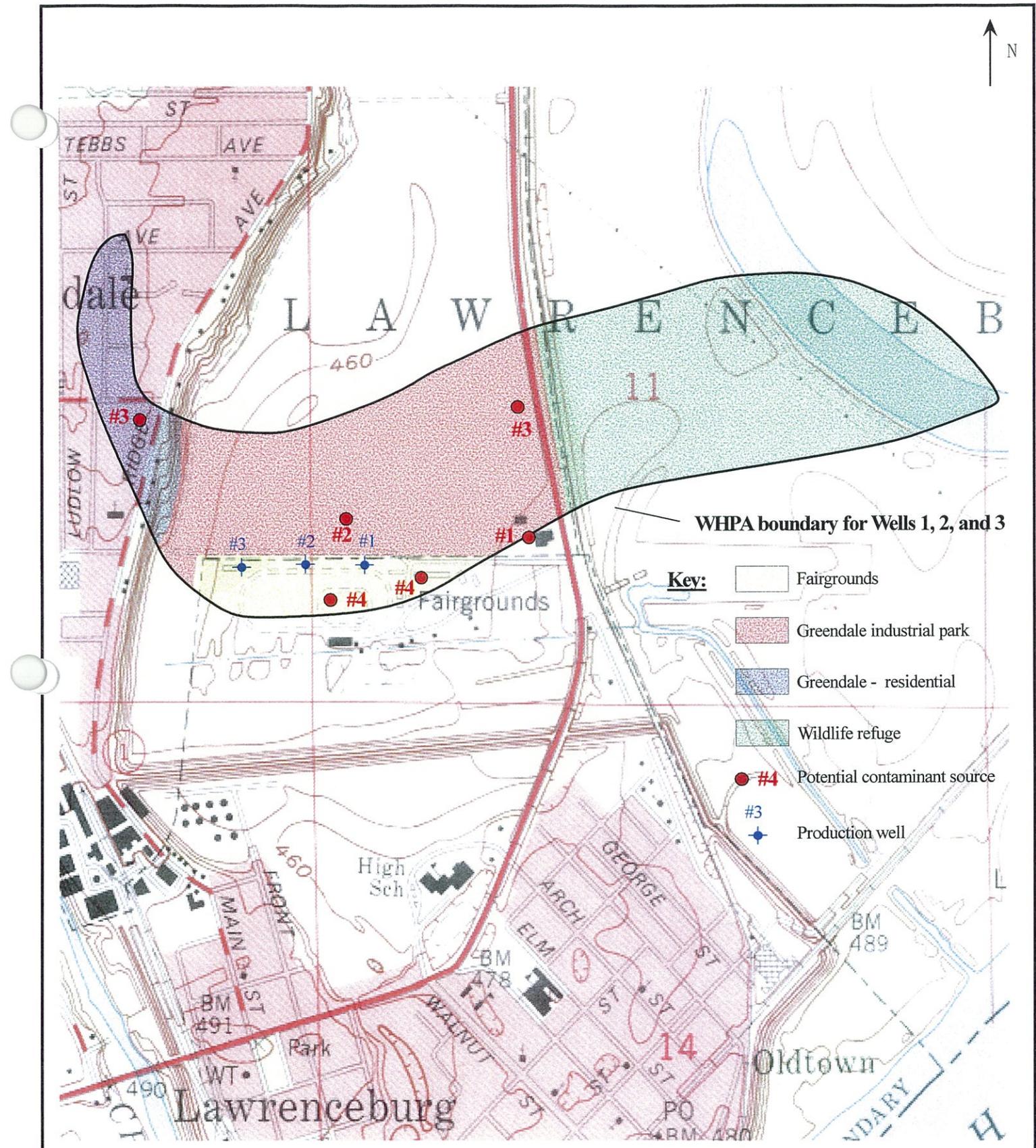
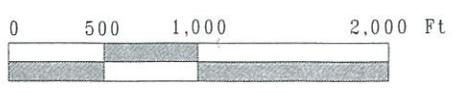
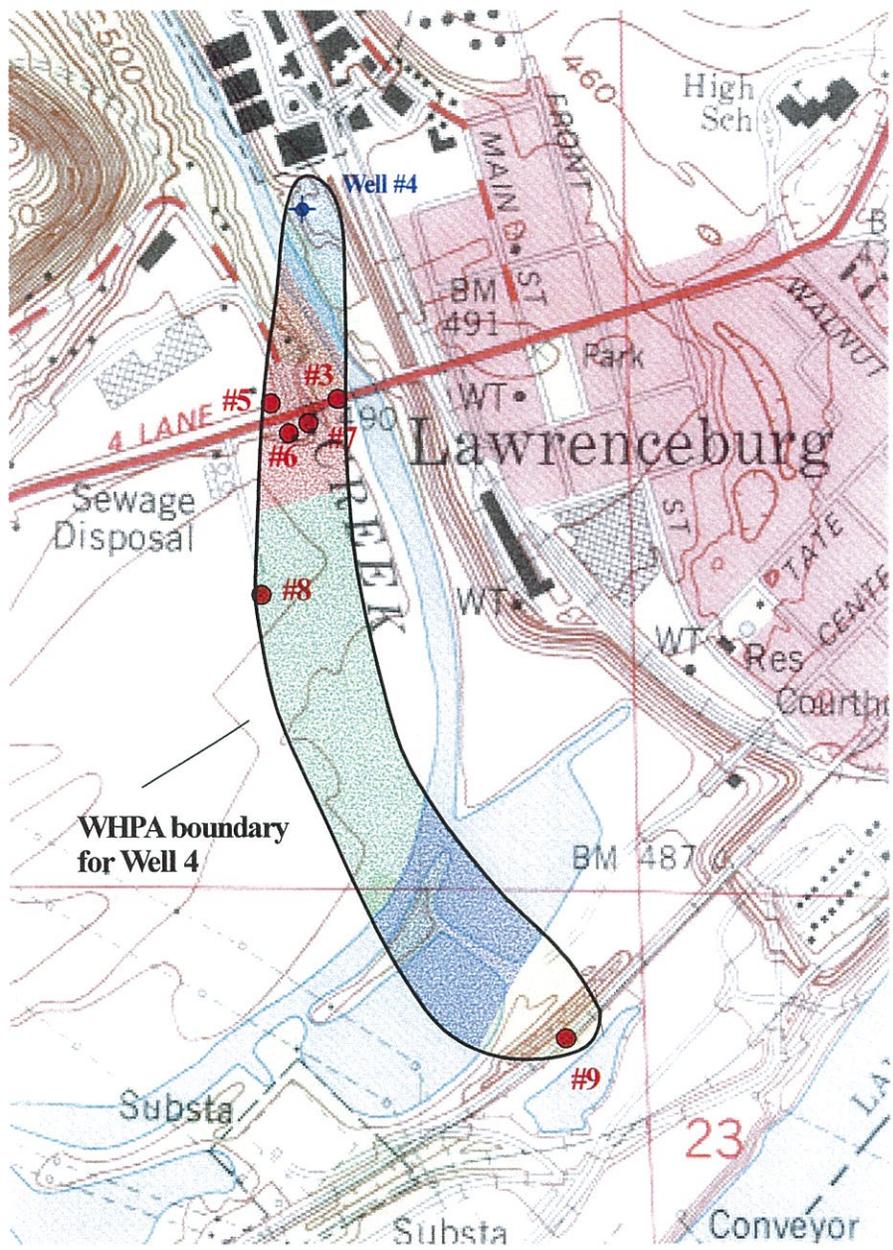


Figure 10. Potential Contaminant Sources in the WHPA for Well #s 1, 2, and 3.

SCALE: 1" = 1,000'



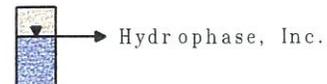
 Hydrophase, Inc.



- Key:**
- | | |
|--|---|
|  Undeveloped floodplain (GM) |  Area by Well #4 (GM) |
|  Commercial properties (B) |  Area by railway (GM) |
|  Tanners Creek & small lakes (GM) |  #9 Potential contaminant source |
| |  Well #4 Production well |

Figure 11. Potential Contaminant Sources in the WHPA for Well #4.

SCALE: 1" = 1,000'



6.0 MANAGEMENT PLAN

This WHPA Management Plan has been written in accordance with 327 IAC 8-4.1-8 of the Wellhead Protection Rule requirements. Section 6.1 discusses the Sanitary Setback Area around each well. Section 6.2 discusses management of the WHPA.

The local planning team (LPT) has been created by the City of Lawrenceburg, who invited representatives from businesses, government, emergency response agencies, property and leaseholders, and concerned individuals from the WHPA to participate. The LPT includes representatives from both the Lawrenceburg and Greendale WHPAs, as they are in close proximity. The LPT consists of the affected parties listed below.

Member name	Affiliation	Address	Phone
Mel Davis	Lawrenceburg Municipal Utilities	230 Walnut St. Lawrenceburg, IN 47025	(812) 532-3500
Andrew Lyons	Water, Wastewater Department Superintendent		(812) 221-0116
Randy Abner	Lawrenceburg Fire Chief		(812) 537-3431
Dan Combs, Jr.	Lawrenceburg Asst, Police Chief		(812) 537-2282
Bill Black, Jr.	Dearborn Co. Disaster Service Coordinator	215 W. High St. Lawrenceburg, IN 47025	(812) 537-3971
Steve Lampert	City Manager	510 Ridge Avenue Greendale, IN 47025	(812) 537-2125

These members have freely volunteered their time and effort to assist in guiding the WHPA effort. The public notice and sign-in sheet for the first LPT meeting are in Appendix D.

6.1 The Sanitary Setback Area

The Sanitary Setback Area extends to a radius of 100 feet around each well. The following four points are required to be addressed in order to manage the Sanitary Setback Area as required by the Rule.

- 1) Management of the Sanitary Setback Area: Lawrenceburg owns the sanitary setback areas around the wells. No dumping, pesticide or fertilizer application, or excess deicer chemicals are allowed within this area. No sewer lines will be allowed within this area. The sanitary setback areas will be monitored daily for unauthorized personnel. Otherwise, the Sanitary Setback Areas will be managed according to the IDEM-approved permits for the four current production wells.
- 2) Storage and Mixing of Chemicals: Lawrenceburg owns the sanitary setback areas around their wells, and no storage or mixing of chemicals, other than those used for water treatment, will be permitted within these areas.
- 3) The wells are elevated and inside a locked fenced area, and each well is surrounded by a security fence. Only personnel authorized by the water department have access to fence keys.
- 4) Best Management Practices for Transportation Routes: Lawrenceburg will not allow any excess application of deicing compounds on any transportation routes in the sanitary setback areas. Signs may be posted on major transportation routes to notify the public of the WHPA boundary. The City of Lawrenceburg will consider restricting vehicles transporting hazardous materials from entry into the Wellhead Protection Area.

6.2 Managing the WHPA

According to the Wellhead Protection Rule, WHPA management must contain a description of the management or monitoring measures for all potential sources of contamination. This involves consideration of types and potential sources of contamination, local land use issues, and the hydrogeology of the WHPA. "Management" can take shape several ways, via management controls practiced by businesses that are potential sources of contamination; promoting voluntary efforts such as facilities' installing secondary containment structures around hazardous materials storage areas, reducing their waste production or recycling, and best management practices; monitoring for groundwater contaminants, education, and already in-place state or federal regulations, such as those governing USTs. Management of

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state and federally regulated potential sources of contamination will be implemented by the relevant regulatory agency, thereby reducing the management burden (per IDEM's Wellhead Protection Program document, page I-14). These issues are addressed in Sections 6.2.1 through 6.2.11.

6.2.1 Management/Monitoring Measures for Potential Sources of Contamination

The data presented in Section 5 (Potential Contaminant Source Inventory, Table 4) indicated the potential sources of contamination in the WHPA.

The management plan for the Lawrenceburg WHPA will include the following management or monitoring measures:

1) USTs and LUSTs: USTs and LUSTs are under IDEM jurisdiction. Management of state and federally regulated potential sources of contamination will be implemented by the relevant regulatory agency, thereby reducing the management burden (per IDEM's Wellhead Protection Program document, page I-14). Lawrenceburg will request updates from IDEM on LUST sites within the WHPA. Site #5 (Gas Barn) will be closed around the end of 2008.

2) The Highway and Railway: Wellhead Protection Signs may be posted where these thoroughfares first encounter the WHPA boundary (see Section 6.2.10). Regarding potential accidents where potential contaminants may be released, emergency responders will be given copies of the WHPA map, and requested to establish a protocol for fire suppression and emergency response that minimize the chance for contaminants to be flushed down into the aquifer (see Section 7.1).

3) Spills: Prompt emergency response and documentation of any contaminant incidents, and documentation and investigation of any complaints that occur within WHPA will be undertaken. The appropriate state agency will be informed of any such situation warranting further investigation. A map showing the WHPA will be provided to the Dearborn County EMA. Emergency information (see Section 7.3) will be posted at the water treatment plant and at the Lawrenceburg Utilities office.

4) Agrochemicals: This issue is addressed in Section 6.2.6. However, Lawrenceburg will work with pesticide and fertilizer users within the WHPA to monitor pesticide use and to identify improved methods of using these chemicals if possible. The Purdue Extension Office and the City of Lawrenceburg – Wellhead Protection Plan – April, 2008

National Resource Conservation Service will be contacted if necessary to provide information on best management practices (see Section 6.2.9, Educational outreach).

5) No pesticides, deicer compounds, or any chemical storage, mixing, transport or disposal will be permitted on the property owned by the City of Lawrenceburg.

6) Other potential sources: Other facilities that have potential contaminants on-site will be contacted with regard to best management practices to minimize the chances for a release of potential contaminants, for example, secondary containment around storage areas for potential contaminants. As part of this effort, questionnaires may be sent to facilities listed on Table 4, to inquire on the type and amount of potentially hazardous materials kept on-site.

7) Records will be updated as discussed in Section 6.2.4, "Updating Records".

8) Public outreach is discussed in 6.2.9. This will also assist in management of the WHPA.

9) Zoning overlays or ordinances will be considered, if necessary, to restrict new potential sources of contamination from locating within the WHPA.

6.2.2 Compliance of Production Wells with Permit Requirements

Permitting, placement, and installation of future production wells will follow comply with state construction standards and permit requirements (327 IAC 8-3). The permits for the four current production wells were approved by IDEM on September 2, 2005.

6.2.3 Monitoring for Contaminants

The current IDEM program requires a sampling frequency of one quarterly sample every third year for VOCs and SOCs. This Management Plan will stipulate maintaining the current monitoring program. The current program (for the 1993-2001 compliance cycle), as mandated by the IDEM Drinking Water Branch, requires the following number and frequency of samples for listed groups of contaminants:

1) VOCs (regulated) – To be sampled every third year;

2) SOCs – To be sampled in the second and third quarters, every third year;

- 3) IOCs (Inorganic Compounds) – To be sampled for every third year;
- 4) Nitrates – To be sampled for annually;
- 5) Bacteriological – Six samples to be collected monthly;
- 6) Sodium – One sample every third year;
- 7) Lead and Copper – Twenty samples every third year between June and September. These are post-distribution samples, to monitor possible contributions of these metals from piping;
- 8) Radionuclides – One sample every four years.

If, at any time, sample analysis indicates the presence of any of the listed contaminants above the specified action levels, IDEM regulations for Public Water Supply – Drinking Water Standards (327 IAC 8-2) specify the steps to be taken. These steps include procedures for reporting the results to IDEM, public notification, and a revised monitoring schedule. If contamination of the aquifer results from a known incident, the Contingency Plan (Section 7 of this document) will be followed. The monitoring schedule for Lawrenceburg for the current year compliance cycle is included as Appendix E.

6.2.4 Updating Records

Methods or procedures for maintaining and updating records concerning changes in potential sources of contamination within the WHPA are required as part of the Management Plan.

The City of Lawrenceburg will contact the County Health Department annually, to be updated on Tier II Reports that are filed every March 1. The EPA RCRA Notifiers list will be reviewed annually for any changes within the WHPA.

The City of Lawrenceburg will be notified in advance of the intention of any new business, facility, or operation that qualifies as a potential source of contamination to locate within the WHPA. This will be done following the procedure in Section 6.2.7.

Removal, closure, or abandonment of potential source of contaminant sites within the WHPA will be recorded, as their change in status becomes known. The City of Lawrenceburg will request that IDEM and the potential source notify the City of Lawrenceburg when the change of status occurs.

Significant changes in pumping rates, installation of new production wells that result in a change in the WHPA boundaries, changes in the potential contaminant source inventory, or other changes in the management or contingency plans will be documented in the space provided in Appendix F of this Wellhead Protection Plan.

These changes will be included in the Phase II Wellhead Protection Plan, which is the required update of the Phase I Plan (this document). For the City of Lawrenceburg, the Phase II submittal will be seven (7) years after IDEM's approval of the Phase I Plan.

A windshield survey will be conducted annually by Water Utility personnel to inspect the WHPA for any additional potential contaminant sources. Any additional potential sources of contamination that are discovered will be added to the potential contaminant source list.

6.2.5 Well Abandonment

Any public water supply wells that are no longer on-line, have been (or will be) discontinued or abandoned, will be inspected to confirm that abandonment has been in accordance with IDNR regulations. Any such wells that have not been abandoned in accordance with IDNR regulations, will be plugged by one of the approved methods in IC 25-39-4-6 & 310 IAC 16-10 (Appendix G)

Information will be solicited at board meetings on any abandoned private wells within the WHPA, and owners of any such wells will be advised on the proper abandonment procedures in order to minimize potential pathways of contamination to the aquifer.

6.2.6 Agrochemicals

The Wellhead Protection Rule requires a description of how use, application, storage, mixing, loading, transportation, and disposal of pesticides complies with IC 15-3-3.5 and 3.6. Pesticides are regulated through the Office of Indiana State Chemist (OISC) at Purdue University. The Indiana Pesticide State Management Plan (SMP) has been created by the OISC

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as a mechanism for protecting groundwater quality. IDEM and the OISC entered into a Memorandum of Understanding in July 1995 under which they agreed to coordinate their activities in promoting the SMP. The OISC will focus on the label directed use of pesticides including application, handling, and storage practices and their potential effects on aquifers located in Indiana. The IDEM Office of Water Management will identify areas susceptible to groundwater contamination and build a database of groundwater quality information. The IDEM and OISC are responsible for screening any complaints received concerning potential contamination of groundwater with pesticides and fertilizers, and initiating any investigative or corrective actions.

Because the protective clay overburden for Lawrenceburg's aquifer is not very thick, it is reasonable to prohibit storage, mixing, loading, transportation and disposal of pesticides in the WHPA. The Dearborn County Extension Office (812-926-1189) will be contacted for the latest information on best management practices for pesticide application in the WHPA.

6.2.7 Notification

The Rule requires a description of how property owners, mineral owners and leaseholders of record are notified that they are located within the WHPA. A notice that the Wellhead Protection Plan has been completed was posted in the Dearborn County Register. Property owners, mineral owners and leaseholders of record will be notified by letter that they are located in a WHPA. The notification will take place in conjunction with the CCR mailing.

6.2.8 Access to the Wellhead Protection Plan

A description of how owners and operators of identified potential sources of contamination are provided access to a copy of the WHPP is a required part of the Management Plan. As part of the process to carry out Section 6.2.7, these owners and operators will be notified by letter by the City of Lawrenceburg that they are within the WHPA, and where they can obtain access to a copy of the WHPP. One copy will be available at the Lawrenceburg Municipal Utilities Office.

6.2.9 Education

This section describes the public outreach program to educate the public and owners or operators of potential sources of contamination about the consequences of groundwater
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contamination and methods available to avoid contamination. The outreach program will consist of:

- 1) Making copies of the WHPP publicly available, as indicated above.
- 2) Including summary information on wellhead protection, to be included within the annual Consumer Confidence Reports (CCR).
- 3) The City Council will include the status of wellhead protection as an item on the agenda at least once per year.
- 4) Posting flyers and informational bulletins at the utility office to inform the public about ways of preventing contamination from impacting groundwater.
- 5) Contacting the Lawrenceburg school system about incorporating drinking water education in school courses on science and the environment.
- 6) Contacting the following educational resources for information to include in additional public meetings to specifically discuss wellhead protection.
 - The Indiana Rural Water Alliance (888-937-4992) can provide technical assistance on groundwater supply, protection and regulatory issues, in addition to connecting water suppliers to other sources of information. Their website is alliance@inh20.org.
 - The Purdue County Extension Service (812-926-1189) is a clearinghouse for information related to agricultural issues. The Extension Office provides training in pesticide use and education services in water quality.
 - The Dearborn County Solid Waste District (800-537-8801) accepts materials (from residential sources) for recycling that are potential contaminants (such as used motor oil and filters, antifreeze, batteries, and mercury). The recycling coordinator also provides public education on household waste issues.
 - The National Rural Water Association, NRWA, website at www.NRWA.org, has additional information on groundwater and wellhead protection. Water conservation ideas

and rate surveys are available at www.waterwiser.org. Another website is www.wateronline.com.

- The EPA has much groundwater and drinking water information available on their website, www.epa.gov/ogwdw.
- The National Environmental Services Center (800-624-8301, extension 3; website: www.NDWC.wvu.edu), funded by the USDA's Rural Utilities Service, provides educational information and technical assistance to small communities (less than 10,000 people).
- Groundwater Guardian (800-858-4844, www.groundwater.org) is a non-profit organization that assists in public education about the nature and value of groundwater.
- IDEM information is available through the Compliance and Technical Assistance Program (800-451-6027; direct number: 317-232-8154), including assistance for vehicle maintenance shops on regulatory issues.
- Earth Day programs include forums for discussing drinking water protection.

6.2.10 WHPA Boundary Markers

Wellhead protection signs may be posted along major thoroughfares that cross the boundary or pass along the perimeter of the WHPA, such as along U.S. Highway 50 and Indiana State Road 1 (Main Street) as part of the Management Plan development.

6.2.11 Other Measures

Other measures can be addressed as this plan is implemented. This section is intended to provide the text location for those other measures. Summaries of wellhead protection provisions that are included in IDEM Statute, Rule and Non-rule Policy are included in Appendix H. Copies of IDEM approval letters are attached as Appendix I.

7.0 CONTINGENCY PLAN

Contingency planning will incorporate services available through the Dearborn County Emergency Management Committee Office in Lawrenceburg. In order to comply with Wellhead Protection Rule 327-IAC-8-4.1-8, part 5, each public water supply system must outline procedures to follow in an emergency situation to provide safe drinking water to the community. The Contingency Plan includes:

- 1) Description of the plan to train local responders
- 2) Emergency response procedures;
- 3) Information provided to local responders;
- 4) Alternate sources of drinking water;
- 5) Notification of Critical Water Users in an Emergency; and
- 6) Availability of the Complete Contingency Plan.

The following sections describe how the City of Lawrenceburg will address the Contingency Plan requirements

7.1 Local Responder Training Plan

The Lawrenceburg and other nearby Fire Departments are required to be trained to the Hazmat awareness level, per 29 CFR 1910.120, with annual updates. The initial training is a 40-hour course, with 8-hour annual “refresher” updates. Training is provided for the fire departments by the Dearborn County EMA. The training occurs at the Dearborn County Water Rescue Facility (401 W. High Street, Lawrenceburg), or at other designated locations. Additional training is provided, in Indiana, by the State Emergency Management Agency, and by private educational groups such as Coastal Training Technologies Corp. (800-767-7703).

The Dearborn County EMA conducts exercises at least once per year which simulate different emergency scenarios. These exercises involve coordinating emergency response teams and fire departments from different municipalities and counties.

Lawrenceburg Municipal Utilities will contact the Lawrenceburg fire departments, the Dearborn County EMA, and the Greater Cincinnati Hazmat Unit to provide them with maps showing the location of the public supply wells and the WHPA, and request that they develop

strategies that minimize the chance of flushing contaminants to the aquifer in the process of responding to a hazardous material incident or fire in the WHPA.

Lawrenceburg Municipal Utilities will hold WHPA update meetings with emergency responders annually, or as necessary, to review any changes to:

- 1) The well locations and wellhead protection area.
- 2) Information to provide to Lawrenceburg Municipal Utilities in the event of a release, this will include the time of the spill, its location, type of contaminants, and the quantity spilled.
- 3) Emergency procedures or phone numbers.
- 4) The potential contaminant source inventory.

Lawrenceburg Municipal Utilities may of course notify the emergency responders of any such changes at more frequent intervals if necessary.

7.2 Procedures to be used in Emergency Response Incidents

This section discusses responses to both intentional and accidental contamination of the water supply.

7.2.1 Intentional Contamination

There are only certain parts of the water supply system where contaminants could be deliberately introduced. These are within the buildings that contain the wells. The steps to respond to detection of contaminants at the wells are given below.

- 1) Issue a general NO USE order.
- 2) Identify the contaminant and how much of the system has been affected.
- 3) Try to contain the contaminant and prevent it from spreading into the entire distribution system by using valves and flushing hydrants.
- 4) Perform extensive water main flushing and sampling in the affected areas.
- 5) When testing indicates that mains are free of the contaminant, issue a BOIL WATER order.
- 6) When bacteria test indicate that the water is safe, cancel the BOIL WATER order.

7.2.2 Accidental Contamination

This type of contamination could enter the distribution system from nearly any point in the system. "Accidental contamination" is broken down into three scenarios: Contaminants in the aquifer being picked up by production wells, Back siphonage or a high pressure chemical pump that could force a treatment chemical into the system, and spills.

I) In the event of a contaminated well, Andrew Lyons and Charles M. Davis will be called immediately (phone numbers given in Section 8.3,e). The wellfield will be shut down until it can be analyzed by Lawrenceburg Utilities. Depending on the type, concentration, and location of contaminant in the system, the options will be evaluated as to how to restore operation and provide safe drinking water to our customers.

II) In the event of back siphonage or a high-pressure chemical pump forcing contaminants into the system, the following procedures would be taken.

- 1) The problem would be located and the system shut down.
- 2) A NO USE order would be issued pending resolution of the problem.
- 3) The main valves would then be used to control the flow of water and isolate the chemical.
- 4) Fire hydrants in the area would be flushed until the water is clean.
- 5) When the mains appear to be clean and testing verifies no chemical is present, a BOIL WATER order will be issued for all water customers.
- 6) If a chemical pump was involved, backflow prevention will be installed.
- 7) If back siphonage was the problem, the cause will be determined, and backflow prevention will be installed.
- 8) When testing shows that no chemical or bacteria remain in the system, the BOIL order will be cancelled and normal operation of the system will be resumed.

III) In the event of spills, the following steps will be taken:

- 1) The Fire Department or Emergency Response Team will respond to a contaminant spill emergency. If absorbent pads or sand are needed, the Lawrenceburg Municipal Utilities will immediately call for assistance and

a licensed professional will be contacted to evaluate the spill and take appropriate action to clean up the area.

- 2) The Lawrenceburg or Greendale (location determining jurisdiction) Fire Chief will complete all reports and notify the appropriate enforcement agencies. IDEM must be notified within 24 hours of a spill (317) 233-7745.

Because there is little of a clay barrier over the aquifer, a professional will be called to assist in recommending what additional actions may be required. These actions may include collecting groundwater samples in areas between the spill site and the production wells, installing monitoring wells, increased sampling frequency, or if the problem is serious enough, a remediation system may be designed to intercept and withdraw the contaminants from the system before they migrate to the wellfield.

7.3 Information for Local Responders

This information must include (area code is 812 unless stated otherwise):

- The location of the WHPA boundaries. The boundaries are depicted on Figure 5-1 of this document.
- The names of community public water suppliers to contact in the event of an emergency.

Andrew Lyons Lawrenceburg Water Superintendent 221-0116

Steve Lampert Greendale City Manager 537-2125

- 24 hour phone numbers for:
 - a) IDEM Office of Emergency Response (OER) (800) 451-6027;
 - b) State, local and city/county police and fire/hazmat team;

Emergency Response Units:

Lawrenceburg E.R.U. 537-4144

Fire Departments:

Lawrenceburg 537-3431

Dearborn Co. Sheriff 537-3431

Lawrenceburg Police Dept. 537-2284

The phone number 537-3431 listed for each department is the Dearborn County Emergency Dispatch Center. This

central dispatch pages out all fire and rescue in Dearborn County.

Indiana State Police: (800) 552-2959

c) Emergency Management Agency in Dearborn County:

Emergency: 537-3431

Office: 537-3971

d) Water supply owner, superintendent and operator

Owner - City of Lawrenceburg, Mel Davis 221-0117

Water Utility Superintendent 537-0651

Water Utility Operator 537-0651

Dearborn County Hospital E.R. 537-8240

e) Water Works Professional for Assessment in the event of contamination: Andrew Lyons 537-0651

f) National Response Center (Toxic Chemical and Oil Spills)

800-424-8802

g) CHEMTREC (Chemical Transportation Emergency)

800-424-9300

7.4 Identification and Description of Potential Alternate Sources of Water

Because the Lawrenceburg wells are not along transportation routes, it is very unlikely that most or all wells would be unsuitable for supplying water following an accidental contaminant release incident.

In an emergency situation, the alternate source of potable water will be Greendale and Aurora systems for the lower level Lawrenceburg distribution system, and the LMS system for the upper level of the Lawrenceburg distribution system. Owners of other high capacity wells may be contacted about alternate sources of drinking water.

In the event of an emergency interruption of the water supply, the County EMA office will be contacted to coordinate water supplies hauled by tanker trucks.

The following is a list of bottled water suppliers that may be contacted in the event of an emergency:

Deer Park: 1-888-657-7638
 Magnetic Springs: 1-800-572-2990
 Alpine Valley: 1-888-672-3400
 Polar: 1-800-235-7873
 Mountain Valley: 1-513-241-3925
 Crystal Water Co.: 1-888-426-8001
 Sears Bottled Water: 1-513-241-1389
 Spring Water Distributors: 1-513-922-3400

Approximately 6,000 to 10,000 five gallon bottles may be shipped direct from each of their suppliers within 24 hours.

Besides being connected to other nearby water utilities, long term options for further groundwater development would be in the Ohio River basin, and probably limited to the Fairgrounds area and possibly the area south of Tanners Creek.

7.5 Procedures and Methods to be used in Notifying Critical Water Users of an Emergency.

Below is a list of critical water users to notify in an emergency:

<u>User</u>	<u>Address</u>	<u>Phone #</u>
Dearborn County Hospital		Emergency # 812-537-8240
Lawrenceburg School Corp.		812-537-7200
St. Lawrence Elementary		812-537-3690
Argosy Casino, 775 E. Eads Parkway		812-539-2002
Ivy Tech Comm. College		812-537-4010

If these users cannot be reached by phone, they will be contacted in person. The critical users will be notified to not use the water or to implement water use restrictions until normal service can be restored. Bottled water suppliers information (Section 7.4) will be provided if necessary.

In the case of a water emergency, all users will be considered "critical", and will be notified by local TV, radio, or door to door by Emergency Response or other designated personnel.

7.6 Emergency Procedures and the Availability of the Complete Contingency Plan

Copies of the City of Lawrenceburg Wellhead Protection Contingency Plan will be kept at the locations listed below:

Water Superintendent's Office: (812) 537-0651

Dearborn County Health Department: (812) 537-8826, or -8838

Dearborn County Administration Bldg: (812) 537-8826

The entire wellhead protection plan will be available at the Water Superintendent's Office. A copy of the comprehensive Dearborn County Emergency Plan will be kept at the Dearborn County Emergency Management Director's office.

Name	Mr. William Black, Jr.
Address	215 West High Street
Phone	(812) 537-3971

8.0 QUALIFICATIONS

The WHPA delineation and hydrogeological interpretations herein are based on available information. The WHPA delineation was prepared in accordance with generally accepted procedures in the field of hydrogeology and groundwater modeling. The delineation was prepared by James E. Carr, Licensed Professional Geologist #1384, of Hydrophase, Inc.

Hydrophase, Inc. is not responsible for unrecorded or undocumented information, or for independent conclusions or recommendations made by others on data presented in this wellhead protection document. Hydrophase, Inc. cannot be held liable for any expense or loss incurred by The City of Lawrenceburg resulting directly or indirectly from any information provided by Hydrophase, Inc. in this wellhead protection document.

Very Respectfully Submitted,
HYDROPHASE, INC.

A handwritten signature in blue ink, appearing to read "James E. Carr".

James E. Carr, LPG
President

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APPENDIX A
WELL LOGS USED IN CROSS SECTION A-B

Record of Water Well

Indiana Department of Natural Resources

Reference Number 234135	Driving directions to well 10FT FROM S LINE FENCE AND 300FT FROM BIG 4 TRACK OLD QUAKER PLANT		Date completed
Owner-Contractor Owner Driller	Name SCHEMLEY DIST CORP A D COOK INC	Address LAWRENCEBURG LAWRENCEBURG, IND	Telephone
Construction Details	Use:	Drilling method:	Pump type:
Well	Depth: 102.0	Pump setting depth:	Water quality:
Casing	Length:	Material:	Diameter: 12.0
Screen	Length:	Material:	Diameter: Slot size:
Well Capacity Test	Type of test:	Test rate: 1250.0 gpm for hrs.	Bail Test rate: gpm for hrs.
	Drawdown: ft.	Static water level: ft.	Bailer Drawdown: ft.
Grouting Information	Material:	Depth: from to	Number of bags used:
	Installation Method:		
Well Abandonment	Sealing material:	Depth: from to	Number of bags used:
	Installation Method:		
Administrative	County: Dearborn	Township: 5N Range: 1W	
	Section: of Section 10	Topo map: Lawrenceburg, KY-IN-OH	
	Grant Number:		
	Field located by:	on:	
	Courthouse location by:	on:	
	Location accepted w/o verification by: HCK	on: Jun 03, 1964	
	Subdivision name:	Lot number:	
	Ft W of EL:	Ft N of SL:	Ft E of WL: Ft S of NL:
	Ground elevation: 510.0	Depth to bedrock: 102.0	Bedrock elevation: Aquifer elevation: 408.0
	UTM Easting:	UTM Northing:	
Well Log	Top	Bottom	Formation
	0.0	7.0	S&G
	7.0	18.0	YEL CLAY & FN SAND
	18.0	25.0	YEL CLAY
	25.0	42.0	YEL CLAY & SAND
	42.0	48.0	HARDPAN
	48.0	52.0	YEL CLAY & SAND
	52.0	61.0	BLUE CLAY
	61.0	72.0	DRY GRAV
	72.0	91.0	WATER BEARING GRAV & CLAY BALL
	91.0	96.0	WATER BEARING FN SAND
	96.0	100.0	WATER BEARING GRAV
	100.0	102.0	LARGE GRAV
Comments	GREENVILLE TREATY; THIS WAS ORIGINALLY A TEST WELL & LATER MADE INTO A PERMANENT WELL;		

Record of Water Well

Indiana Department of Natural Resources

Reference Number *Driving directions to well* *Date completed*
251852 FROM BELPARS CINCINNATI OFFICE, TURN N ON RT 128 GO .25 MI TAKE I 275 W
 TAKE GREENDALE XIT, TURN L ON RIDGE AVE, TURN R ON BROWN ST; CO ON R Aug 01, 1991

Owner-Contractor Name	Address	Telephone
Owner PIERSON HOLLOWELL CO	100 BROWN ST, LAWRENCEBURG, IN	(812) 381-2838
Driller GEO DRILL	715 PASADENA DR, LEXINGTON, KY	(606) 277-7735
Operator HERB FRARY	License: 981	
Company BELPAR ENVIRONMENTAL INC	6050 RT 128, MIAMITOWN, OH	(513) 353-4500

Construction Details

Well	<i>Use:</i> TEST	<i>Drilling method:</i> Rotary	<i>Pump type:</i>
	<i>Depth:</i> 35.0	<i>Pump setting depth:</i>	<i>Water quality:</i> CLEAR
Casing	<i>Length:</i> 20.0	<i>Material:</i> PVC	<i>Diameter:</i> 2.0
Screen	<i>Length:</i> 15.0	<i>Material:</i> PVC	<i>Diameter:</i> 2.0 <i>Slot size:</i> .01

Well Capacity Test

<i>Type of test:</i> BAILING	<i>Test rate:</i> gpm for hrs.	<i>Bail/Test rate:</i> gpm for hrs.
<i>Drawdown:</i> ft.	<i>Static water level:</i> ft.	<i>Bailer Drawdown:</i> ft.

Grouting Information

<i>Material:</i> BENTONITE	<i>Depth:</i> from 16.0 to 18.0
<i>Installation Method:</i> TREMIE	<i>Number of bags used:</i> 1.0

Well Abandonment

<i>Sealing material:</i>	<i>Depth:</i> from to
<i>Installation Method:</i>	<i>Number of bags used:</i>

Administrative

<i>County:</i> Dearborn	<i>Township:</i> 5N <i>Range:</i> 1W		
<i>Section:</i> NW of the SW of the SE of Section 10	<i>Topo map:</i> Lawrenceburg, KY-IN-OH		
<i>Grant Number:</i>			
<i>Field located by:</i>	<i>on:</i>		
<i>Courthouse location by:</i>	<i>on:</i>		
<i>Location accepted w/o verification by:</i>	<i>on:</i>		
<i>Subdivision name:</i>	<i>Lot number:</i>		
<i>Ft W of EL:</i>	<i>Ft N of SL:</i>	<i>Ft E of WL:</i>	<i>Ft S of NL:</i>
<i>Ground elevation:</i> 525.0	<i>Depth to bedrock:</i> 35.0	<i>Bedrock elevation:</i>	<i>Aquifer elevation:</i> 490.0
<i>UTM Easting:</i>		<i>UTM Northing:</i>	

Well Log

Top	Bottom	Formation
0.0	2.0	GRAV & SAND
2.0	12.0	BR ELASTIC CLAY
12.0	16.0	RED BR CRS SAND
16.0	18.0	BR SAND
18.0	30.0	SAND & P GRAV
30.0	35.0	GRAY STIFF CLAY

Comments SEE MAP

Well Formation Log

Lawrenceburg Municipal Utilities Well # 1

<input type="checkbox"/> TEST	DATE	2/21/2006	State	Indiana	Project	2750-F
<input checked="" type="checkbox"/> PERMANENT	Well No.	1	City	Lawrenceburg	Section	15
	UTM 16S	0685418	County	Dearborn	Township	5N
	UTM	4330482	Civil Twsp.		Range	1W

OWNER: Lawrenceburg Municipal Utilities

LAND DESCRIPTION: Dearborn County Fairgrounds / Lawrenceburg Speedway along backstretch

Street or Road:

	From Natural Ground Level			
	Depth top of stratum (ft)	Depth to bottom of stratum (ft)	Thickness of stratum (ft)	Static water level (ft)
Brown clay	0	8	8	
Fine & medium & coarse sand & gravel	8	29	21	10.2
Brown clay	29	30	1	
Fine & medium & coarse sand & gravel (clay balls)	30	41	11	
Fine & medium sand with silt	41	52	11	
Fine & medium sand with silty clay	52	57	5	
Fine & medium & coarse sand & gravel w/ brown clay balls	57	62	5	
Fine & medium & coarse sand & gravel w/ lots of brown clay balls	62	67	5	
Fine & medium & coarse sand & gravel	67	72	5	
Large rocks 1 1/2" to 2" in diameter	72	77	5	
Fine & medium & coarse sand and gravel	77	81	4	
Fine & medium gravel, some sand	81	82	1	
Fine gravel	82			

Hole 20" dia. Drilled by Cable tool

Rotary Hole Grouted with _____

Casing 20" OD from 2'-0" above grade to 67' below grade. Weight 78.6

Screen 20" tele set from 67' to 82'

Make Johnson Type SSWW Slot 0.100

Pumping Test 1232 GPM drawdown to 15.11 feet after 24 hours pumping.

Driller: Delford Dunn

Well Formation Log

Lawrenceburg Municipal Utilities Well #2

<input type="checkbox"/> TEST	DATE	3/1/2006	State	Indiana	Project	2750-F
<input checked="" type="checkbox"/> PERMANENT	Well No.	2	City	Lawrenceburg	Section	15
	UTM 16S	0685262	County	Dearborn	Township	5N
	UTM	4330478	Civil Twsp.		Range	1W

OWNER: Lawrenceburg Municipal Utilities

LAND DESCRIPTION: Dearborn County Fairgrounds / Lawrenceburg Speedway along backstretch
Street or Road: HWY 50 at County Fairgrounds

FORMATION	From Natural Ground Level			
	Depth top of stratum (ft)	Depth to bottom of stratum (ft)	Thickness of stratum (ft)	Static water level (ft)
Light brown clay	0	7	7	
Fine & medium & coarse sand & gravel	7	24	17	8.6
Fine & medium & coarse sand, fine & medium gravel	24	33	9	
Fine & medium & coarse sand & gravel	33	53	20	
Fine & medium & coarse sand & fine gravel	53	57	4	
Fine & medium & coarse sand & fine gravel	57	62	5	
Fine & medium & coarse sand w/ brown clay balls	62	69	7	
Grey clay strip	69	69.5	0.5	
Fine & medium & coarse sand & gravel (traces of clay)	69.5	75	5.5	
Coarse sand with some fine & medium sand	75	77	2	
Shale	78	79	1	

Hole 20" dia. Drilled by Cable tool
 Rotary Hole Grouted with _____
 Casing 20" OD from 3'-0" above grade to 62' below grade. Weight 78.6
 Screen 20" tele set from 62' to 77'
 Make Johnson Type SSWW Slot Top -5'0" - 0.040 Middle -7'0" - 0.100 Bottom -5'0" - 0.120
 Pumping Test 1218 GPM drawdown to 16.57 feet after 72 hours pumping.

Driller: **Delford Dunn**

Well Formation Log

Lawrenceburg Municipal Utilities Well # 3

<input type="checkbox"/> TEST	DATE	3/27/2006	State	Indiana	Project	2750-F
	Well No	3	City	Lawrenceburg	Section	15
	UTM 16S	0685100	County	Dearborn	Township	5N
	UTM	4330461	Civil Twsp		Range	1W

OWNER: Lawrenceburg Municipal Utilities

LAND DESCRIPTION: Dearborn Co. Fairgrounds along the backstretch of Lawrenceburg Speedway

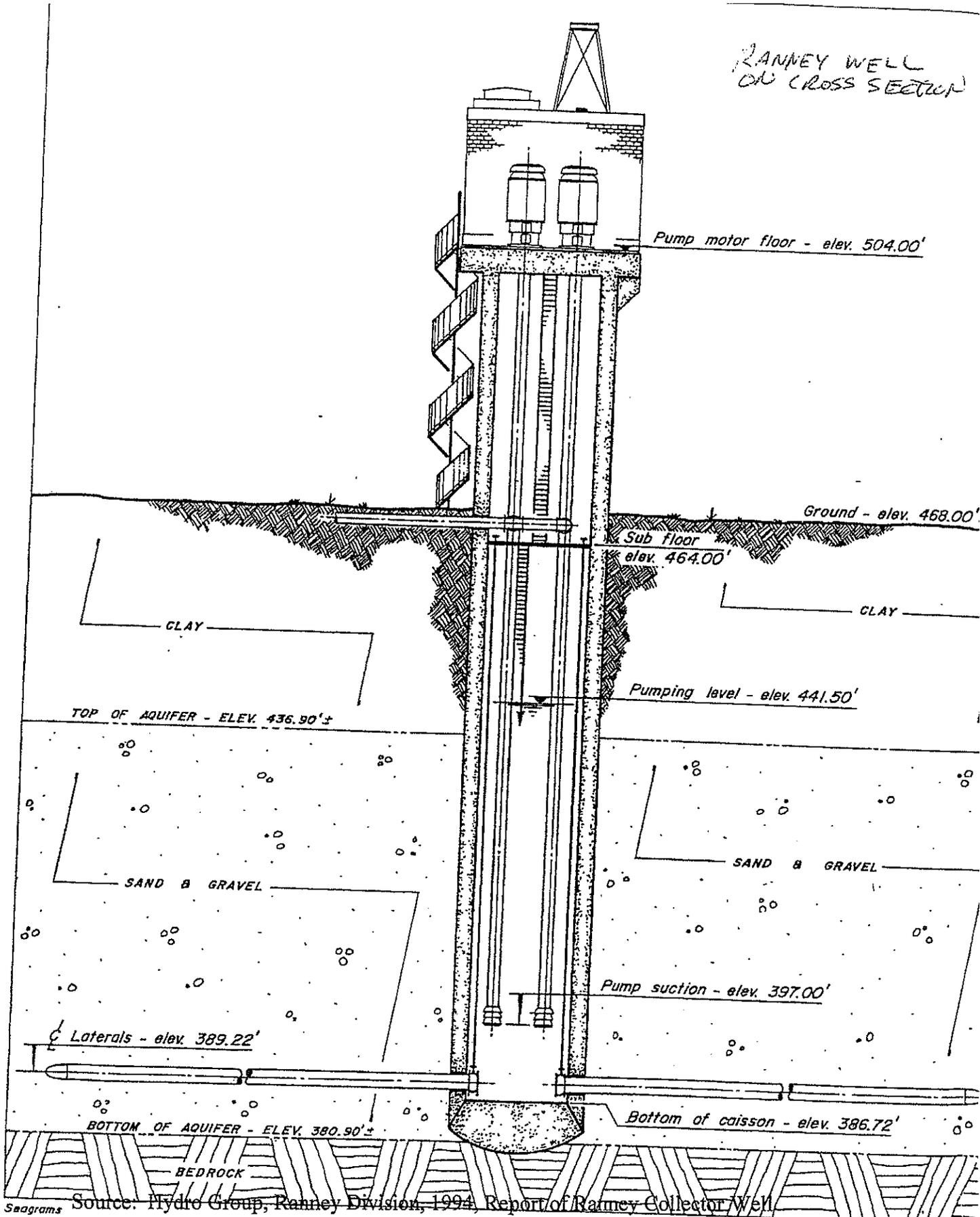
Street or Road: Hwy 50 at Dearborn Co. Fairgrounds northern boundary

FORMATION	From Natural Ground Level			
	Depth top of stratum (ft)	Depth to bottom of stratum (ft)	Thickness of stratum (ft)	Static water level (ft)
Brown clay	0	8	8	
Large gravel w/fine, medium, & coarse sand	8	20	12	8.4
Fine, medium, & coarse sand & gravel	20	29	9	
Brown silty clay	29	30	1	
Fine, medium, & coarse sand & gravel (clay balls)	30	50	20	
Fine, medium, & coarse sand	50	55	5	
Grey fine, medium, & coarse sand & gravel w brown clay balls	55	60	5	
Fine, medium, & coarse sand & gravel w/lg. rocks reddish in color	60	74	14	
Shale	74	76	2	

Hole 20" dia. Drilled by Cable tool
 Rotary Hole Grouted with
 Casing 20" OD from 3'-0" above grade to 59'-8" below grade. Weight 78.6
 Screen 20" tele set from 59'8" to 74'8"
 Make Johnson Type SSWW Slot 0.100
 Pumping Test 1254 GPM drawdown to 15.2 feet after 24 hours pumping.

Driller: Delford Dunn

RANNEY WELL
ON CROSS SECTION



Seagrams

Source: Hydro Group, Ranney Division, 1994 Report of Ranney Collector Well Inspection, for Joseph E. Seagram & Sons, Inc., Lawrenceburg, Indiana.

Record of Water Well

Indiana Department of Natural Resources

Reference Number	Driving directions to well		Date completed
234109	440' FROM S LINE 440' FROM E LINE		Nov 20, 1938
Owner-Contractor	Name	Address	Telephone
Owner Driller	LOUIS SCHESTERMAN DEARBORN DEVELOPMENT CORP		
Construction Details			
Well	Use:	Drilling method:	Pump type:
	Depth: 440.0	Pump setting depth:	Water quality:
Casing	Length: 140.0	Material:	Diameter: 8.0
Screen	Length:	Material:	Diameter: Slot size:
Well Capacity Test	Type of test:	Test rate: gpm for hrs.	BailTest rate: gpm for hrs.
	Drawdown: ft.	Static water level: ft.	Bailer Drawdown ft.
Grouting Information	Material:	Depth: from to	
	Installation Method:	Number of bags used:	
Well Abandonment	Sealing material:	Depth: from to	
	Installation Method:	Number of bags used:	
Administrative	County: Dearborn	Township: 5N	Range: 1W
	Section: NEof the SE of Section 14	Topo map: Lawrenceburg, KY- IN-OH	
	Grant Number:		
	Field located by:	on:	
	Courthouse location by:	on:	
	Location accepted w/o verification by: HCK	on: Jun 03, 1964	
	Subdivision name:	Lot number:	
	Ft W of EL:	Ft N of SL:	Ft E of WL: Ft S of NL:
	Ground elevation: 479.0	Depth to bedrock: 125.0	Bedrock elevation: 354.0 Aquifer elevation:
	UTM Easting:		UTM Northing:
Well Log	Top	Bottom	Formation
	0.0	16.0	CLAY LOAM
	16.0	125.0	S&G
	125.0	159.0	SH BLUE GRAY
	159.0	163.0	LS HARD
	163.0	221.0	SH GRAY GAS SALT WATER
	221.0	231.0	LIME GRAY SHOW GAS AT 231
	231.0	272.0	SH LIGHT BR
	272.0	295.0	LIME SANDY SHEETS SHOW GAS
Comments	440 SL 440 EL ; GREENVILLE TREATY; OIL & GAS;		

APPENDIX B

MODEL OUTPUT / EXAMPLE MODEL INPUT

DATA INPUT: ASM 6.0

PROPERTY:

[1] HYDR. CONDUCTIVITIES

MIN VALUE	7.00 E-03 FT/S
MAX VALUE	7.00 E-03 FT/S
INACTIVE NODES	0.0 E-00 FT/S

[2] STORAGE COEFFICIENTS/PRESCR. HEAD CELLS

MIN VALUE	0.25
MAX VALUE	0.25
PRESCRIBED HEAD CELL MARKER VALUE	-1.0
INACTIVE CELL MARKER VALUE	0.0
ACTIVE CELL MARKER VALUE	1.0

[3] INITIAL HEADS/PRESCR. HEAD VALUES

MIN VALUE	454.1 FT
MAX VALUE	455.0 FT

[4] AVERAGE GROUNDWATER RECHARGE

MIN VALUE	3.2E-08 FT ³ /S/FT ²
MAX VALUE	3.2E-08 FT ³ /S/FT ²

[5] LEAKAGE FACTORS

MIN VALUE	0.00E-00/S
MAX VALUE	0.00E-00/S

[6] WATER LEVELS OF SURFACE WATERS

MIN VALUE	000.0 FT
MAX VALUE	000.0 FT

[7] BOTTOM LEVELS OF SURFACE WATERS

MIN VALUE	000.0 FT
MAX VALUE	000.0 FT

[8] BOTTOM LEVEL OF AQUIFER

MIN VALUE	350 FT
MAX VALUE	400 FT

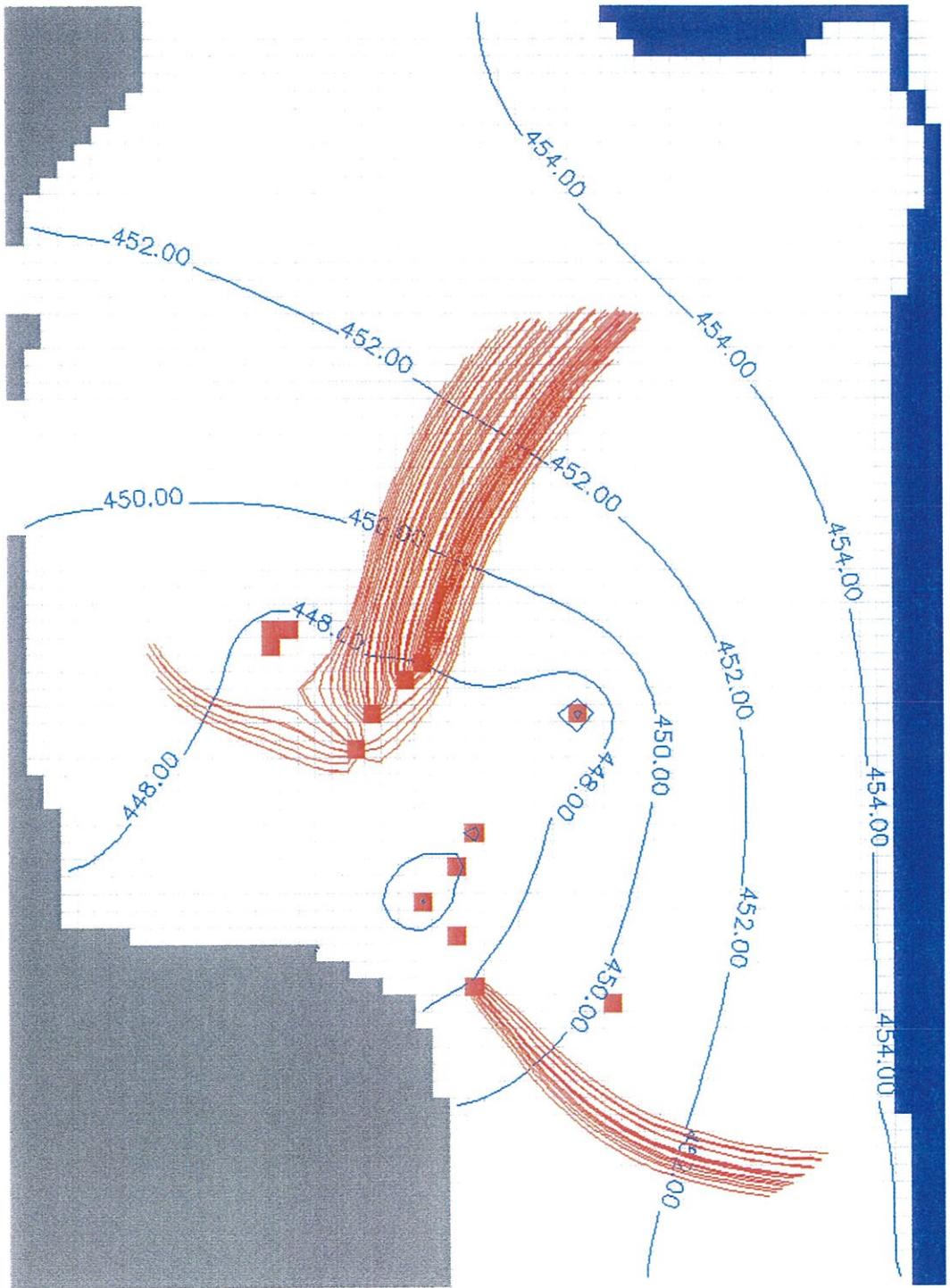
[9] TOP LEVEL OF AQUIFER

MIN VALUE	455 FT
MAX VALUE	470 FT

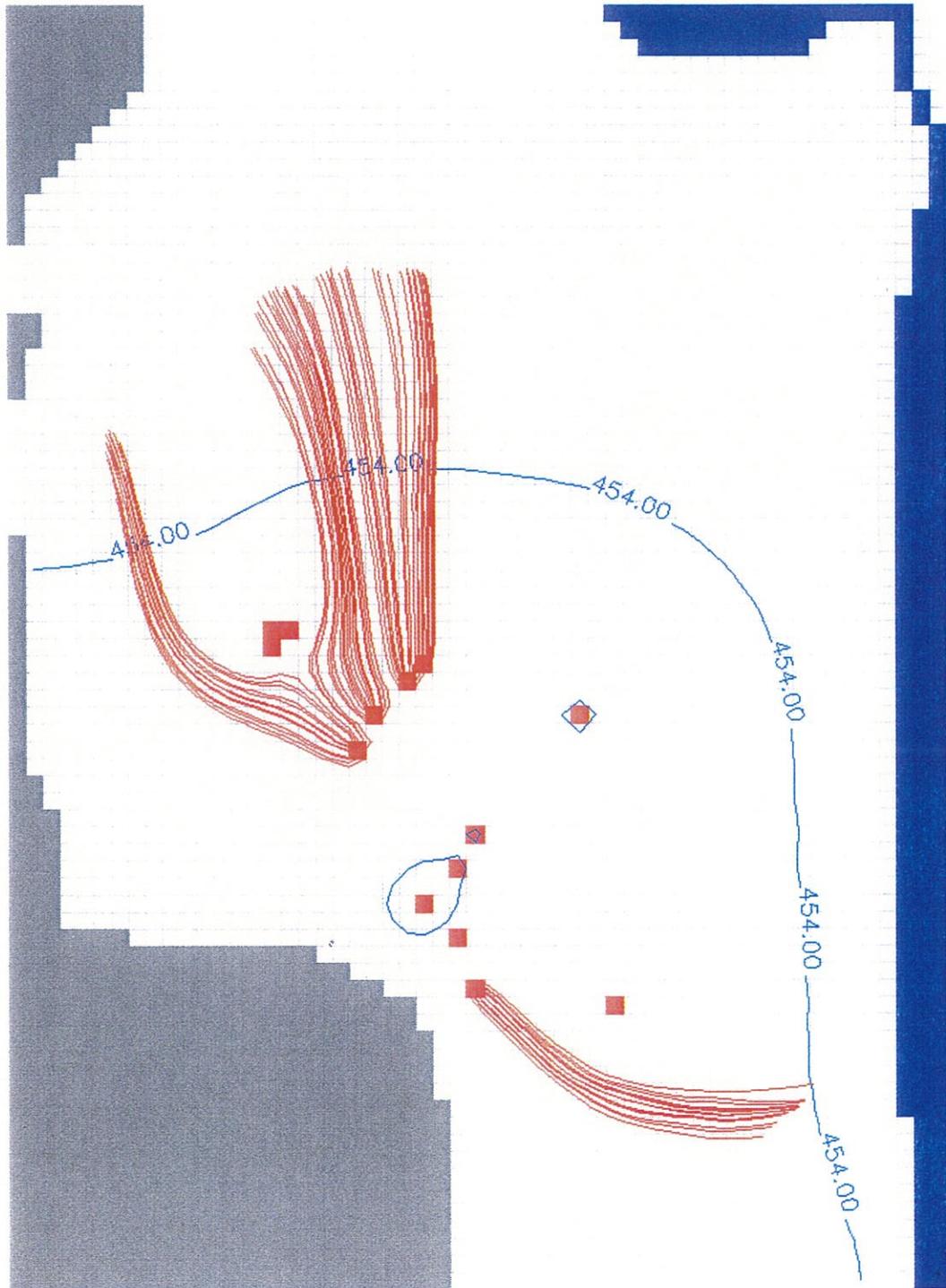
[10] BOUNDARY FLUXES

MIN VALUE	0.0 FT ³ /S
-----------	------------------------

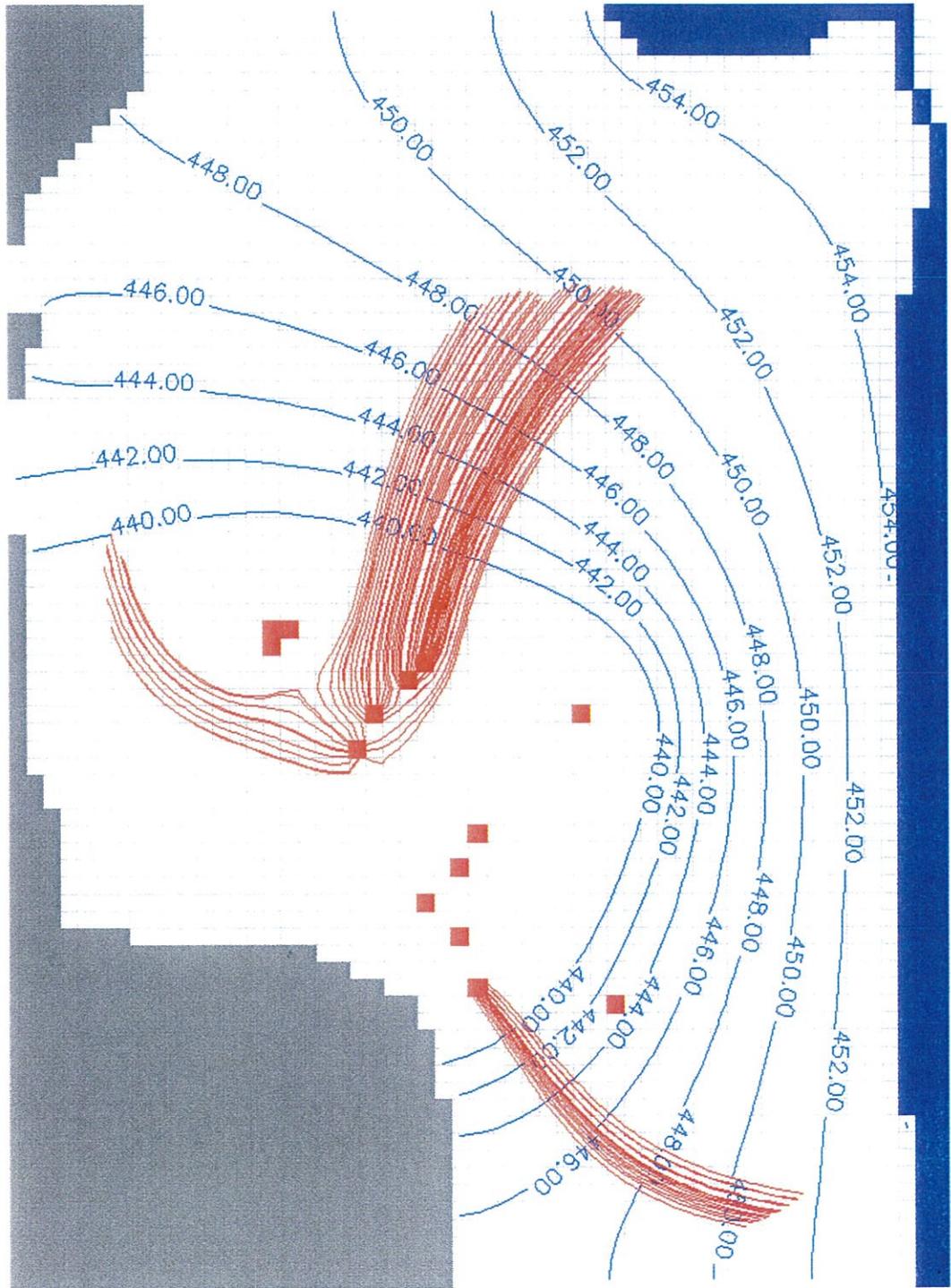
Run 1 - Basic Model



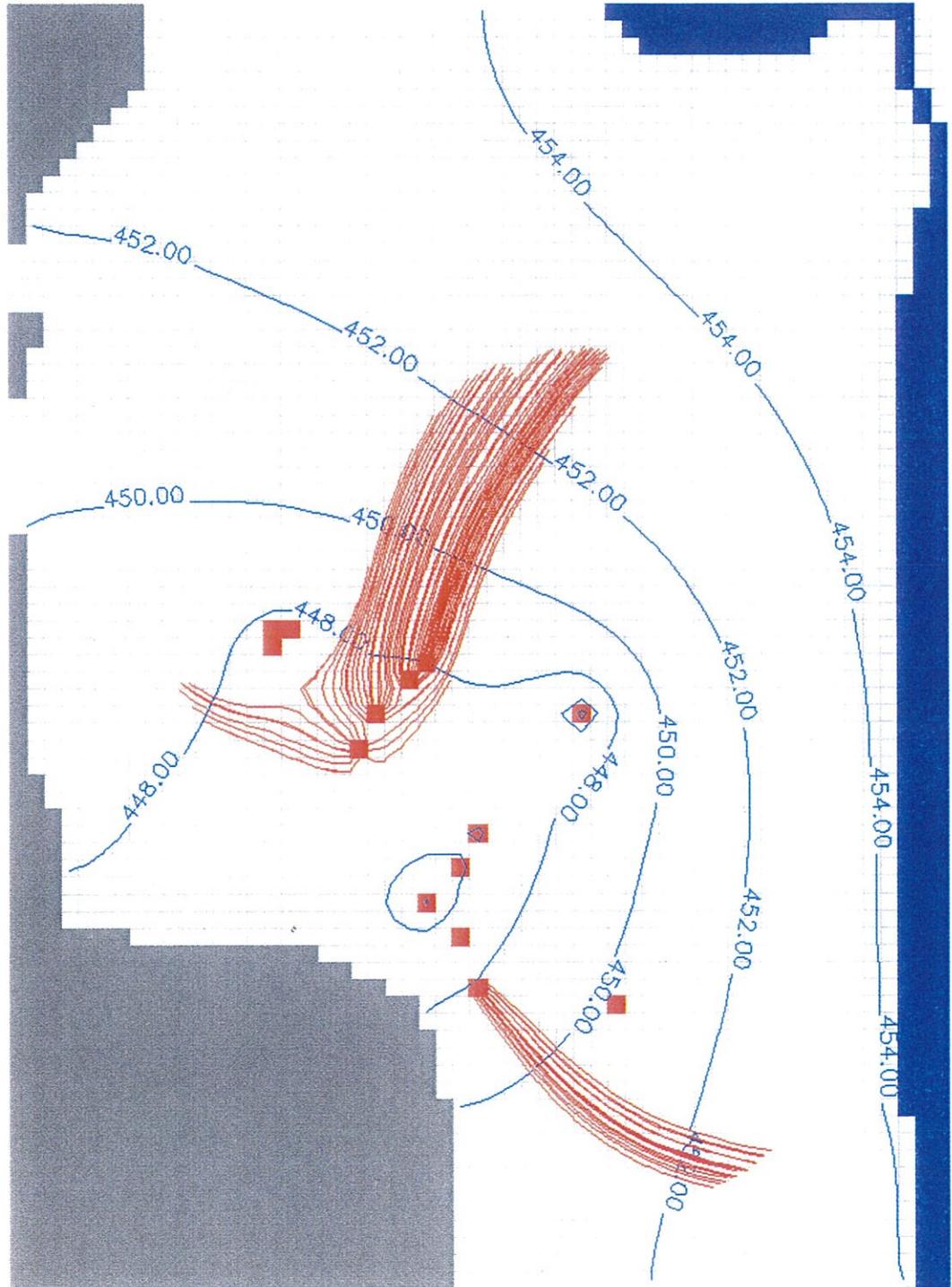
Run 2 – Increased Hydraulic Conductivity (0.02 ft/sec)



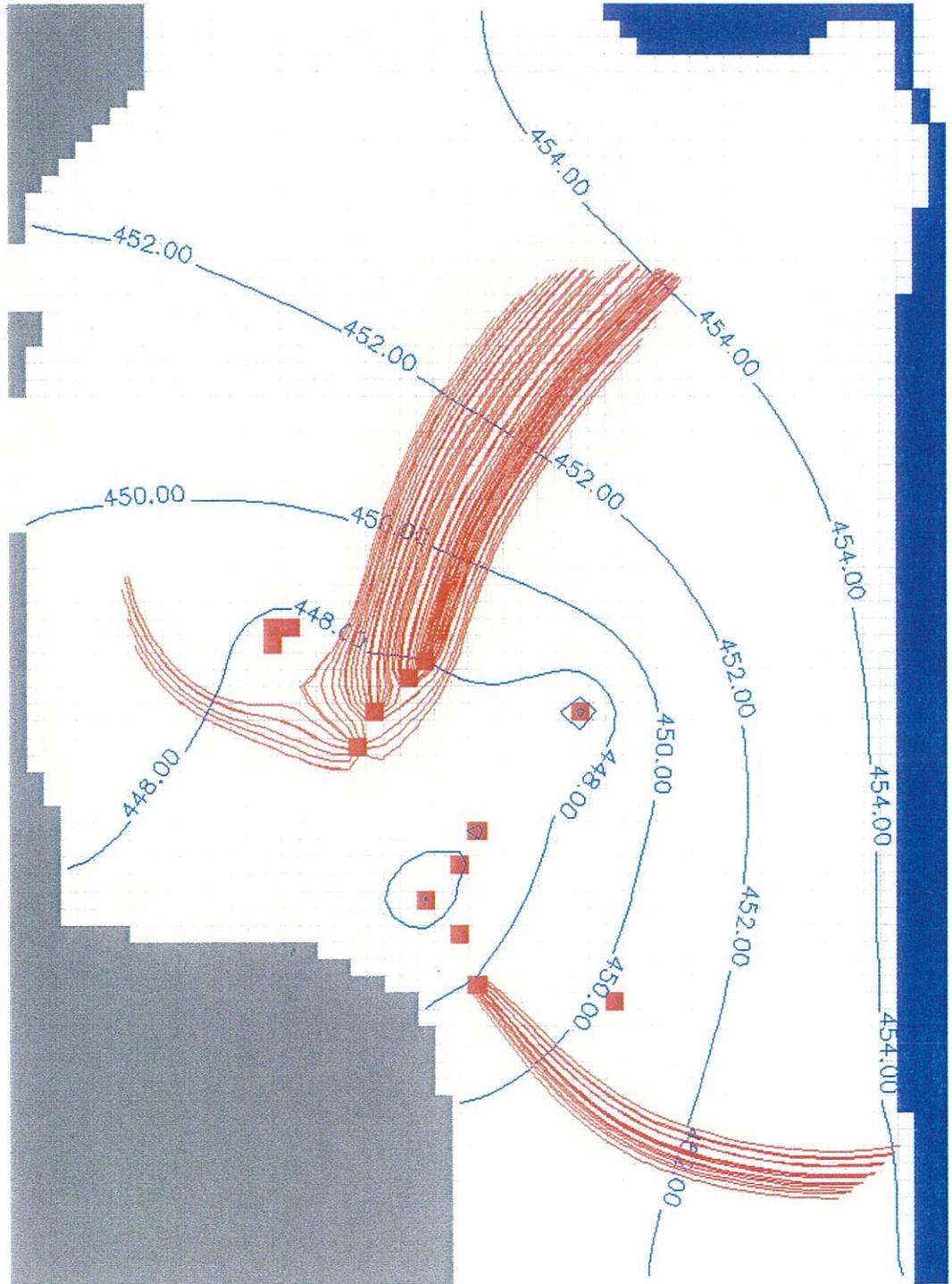
Run 3 – Decreased Hydraulic Conductivity (0.0025 ft/sec)



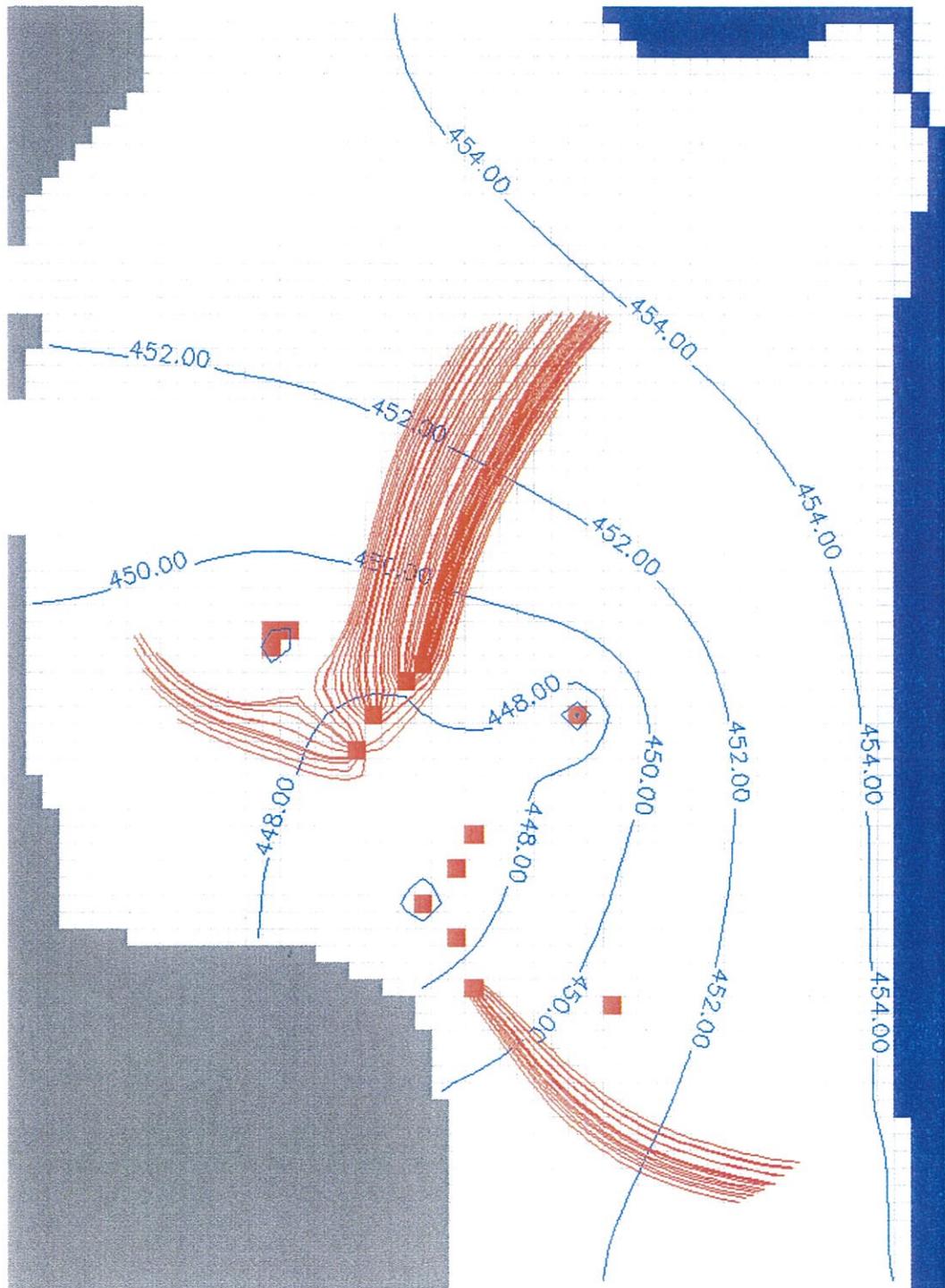
Run 4 – Increased Porosity (0.30)



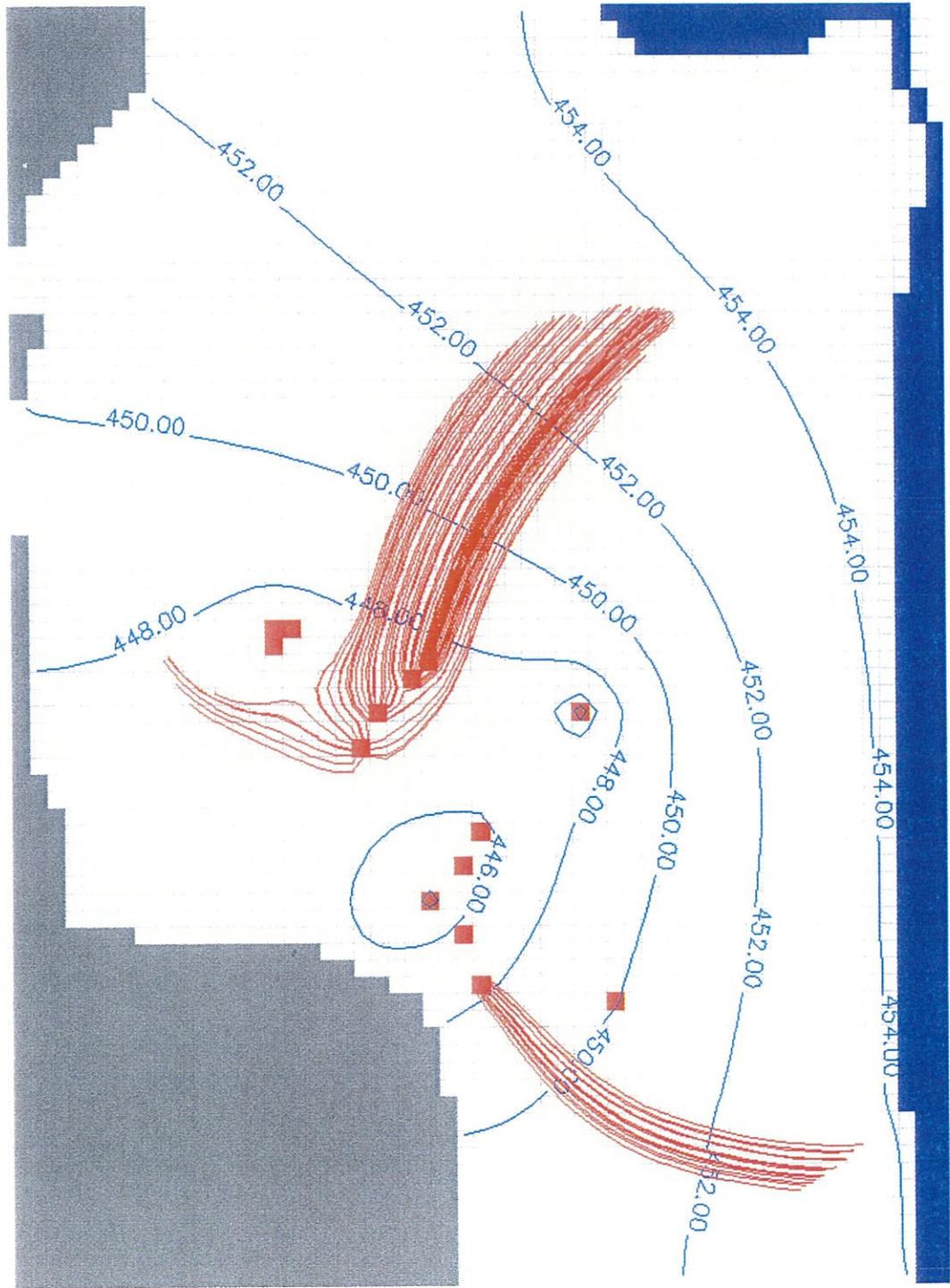
Run 5 – Decreased Porosity (0.20)



Run 6 – Increased Recharge (16" per year)



Run 7 – Decreased Recharge (8" per year)



APPENDIX C

**POTENTIAL CONTAMINANT SOURCE INVENTORY
SUPPORTING INFORMATION**

FirstSearch Technology Corporation

Environmental FirstSearch™ Report

TARGET PROPERTY:

WELLHEAD PROTECTION

LAWRENCEBURG IN 47025

Job Number: 031211

PREPARED FOR:

Hydrophase, Inc

4314 Fairhope Drive

Indianapolis, IN 46237

12-07-06



Tel: (317) 823-3500

Fax: (317) 823-3535



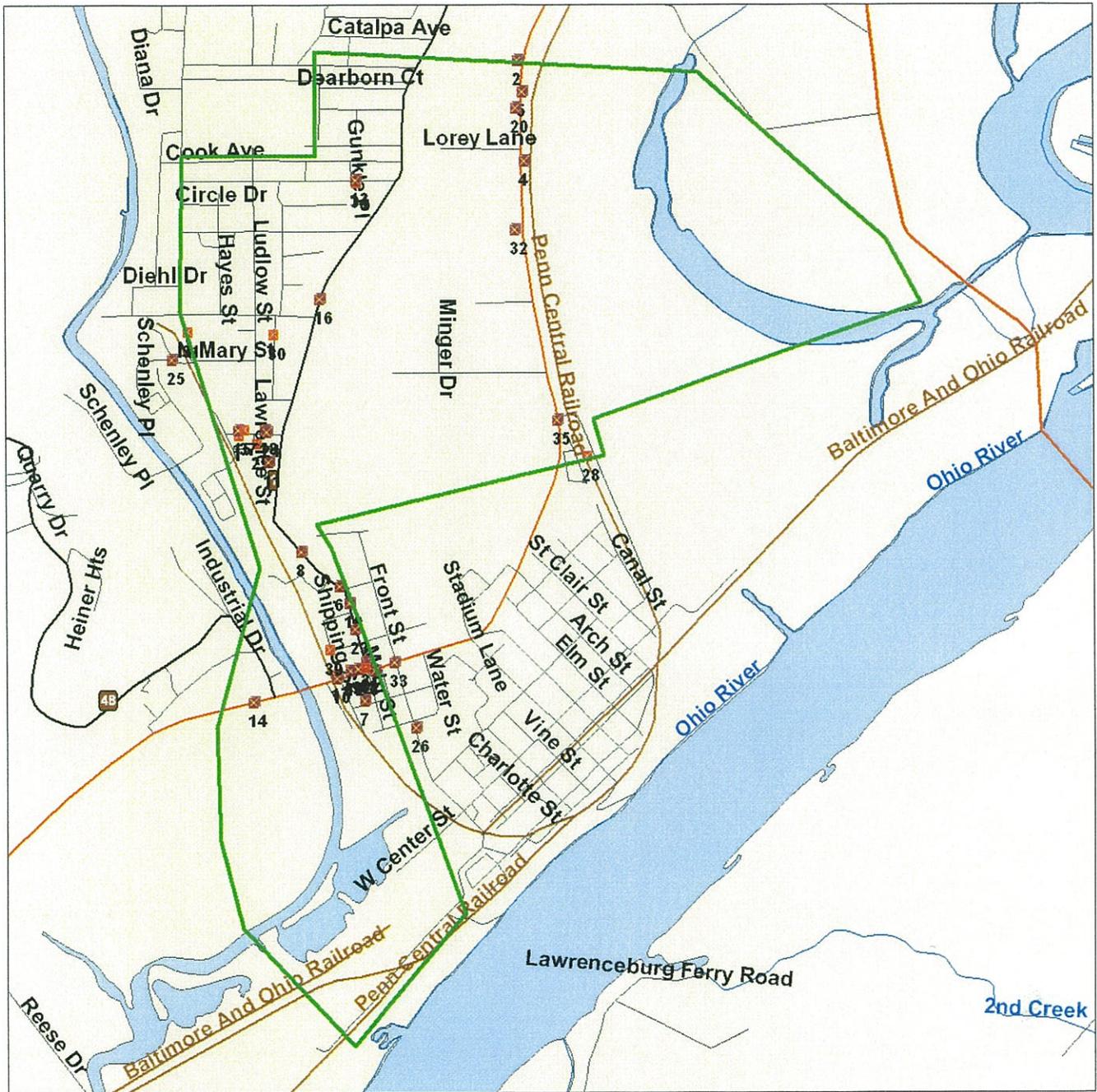
Environmental FirstSearch

.05 Mile Radius from Area

AAI: Multiple Databases



WELLHEAD PROTECTION , LAWRENCEBURG IN 47025



Source: 2002 U.S. Census TIGER Files

Area Polygon	
Identified Site, Multiple Sites, Receptor	
....., DELNPL, Brownfield, Solid Waste Landfill (SWL), Hazardous Waste	
.....alland.....	
Railroads	

Environmental FirstSearch Sites Summary Report

TARGET SITE: WELLHEAD PROTECTION
LAWRENCEBURG IN 47025

JOB: 031211

TOTAL: 370 **GEOCODED:** 135 **NON GEOCODED:** 235 **SELECTED:** 370

Page No.	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
1	AIRS	PERNOD RICARD USA, SEAGRAM LAWRENC IN0087649/AIRS DATABASE	7 RIDGE AVENUE LAWRENCEBURG IN 47025	0.00 --	6
2	BROWNFIELD	LAWRENCEBURG GAS COMP. IC-6941101/INSTITUTIONAL CONTRO	336 SECOND ST. LAWRENCEBURG IN 47025	0.00 --	7
3	CERCLIS	ALTERNATIVE PLASTICS FIRE RESPONSE INN000509989/NOT PROPOSED	205 BROWN STREET GREENDALE IN 47025	0.00 --	1
3	DOCKET	MOLE-MED, INC. 05-1997-0465/ICIS	515 MAIN ST. LAWRENCEBURG IN 47025	0.00 --	23
4	DOCKET	MOLE-MED, INC. 05-1998-0526/ICIS	515 MAIN ST. LAWRENCEBURG IN 47025	0.00 --	23
4	DOCKET	SEAGRAM JOSEPH & SONS INC 05-1987-0531/ICIS	7 RIDGE AVE. LAWRENCEBURG IN 47025	0.00 --	6
5	DOCKET	SEAGRAM JOSEPH & SONS INC 05-1995-0024/ICIS	7 RIDGE AVE. LAWRENCEBURG IN 47025	0.00 --	6
6	ERNS	INDIANA/MICHIGAN POWER CO 271783/FIXED FACILITY	TANNER S CREEK PLANT I AND LAWRENCEBURG IN 46801	0.00 --	4
7	ERNS	JOSEPH E. SEAGRAM & SONS 596579/UNKNOWN	7 RIDGE AVENUE LAWRENCEBURG IN 47025	0.00 --	6
7	ERNS	568055/UNKNOWN	TANNERS CREEK PLANT / FRONT LAWRENCEBURG IN 47025	0.00 --	4
8	ERNS	150181/PIPELINE RELATED	TANNERS CREEK POWER I AND M LAWRENCEBURG IN	0.00 --	4
9	FEDOTHER	MOLE-MED, INC. 064439IN001	515 MAIN ST LAWRENCEBURG IN 47025	0.00 --	23
10	FINDS	LAWRENCEBURG MUNICIPAL UTILITIES 110006764821/FRS	327 EADS PKWY LAWRENCEBURG IN 47025	0.00 --	22
12	FINDS	HAAG FORD SALE IND985003847	405 EADS PARKWAY LAWRENCEBURG IN 47025	0.00 --	17
13	FINDS	HAAG FORD SALE INC 110012077331/FRS	405 EADS PKWY E LAWRENCEBURG IN 47025	0.00 --	17
14	FINDS	HOLLOWELL-VENEER CO 110011964062/FRS	100 BROWN ST LAWRENCEBURG IN 47025	0.00 --	18
15	FINDS	JACK S AUTO CTR 110012028885/FRS	548 MAIN ST LAWRENCEBURG IN 47025	0.00 --	19
16	FINDS	JOHNS BODY SHOP 110007571323/FRS	1072 E EADS PKWY LAWRENCEBURG IN 47025	0.00 --	5
18	FINDS	JOHNSON SERVICE STATION IND984994962	1072 EADS PKWY LAWRENCEBURG IN 47025	0.00 --	5
19	FINDS	JOHNSON SERVICE STATION 110012072728/FRS	1072 EADS PKWY LAWRENCEBURG IN 47025	0.00 --	5
20	FINDS	KENNETT TRUCK STOP 110012036313/FRS	1049 EADS PKWY LAWRENCEBURG IN 47025	0.00 --	20

Environmental FirstSearch Sites Summary Report

TARGET SITE: WELLHEAD PROTECTION
LAWRENCEBURG IN 47025

JOB: 031211

TOTAL: 370 **GEOCODED:** 135 **NON GEOCODED:** 235 **SELECTED:** 370

Page No.	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
21	FINDS	LAWRENCEBURG ELECTRIC DEPT IN0000332353	405 MAIN ST LAWRENCEBURG IN 47025	0.00 --	21
22	FINDS	LAWRENCEBURG GAS CO IN0000596031	336 SECOND ST LAWRENCEBURG IN 47025	0.00 --	7
23	FINDS	GREENDALE UTILITIES PUBLIC WATER S IND984922229	510 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	16
24	FINDS	LAWRENCEBURG MUNI UTIL.ELEC DEPT IND984875948	327 EADS PKWY LAWRENCEBURG IN 47025	0.00 --	22
25	FINDS	LAWRENCEBURG PUBLIC WATER SUPPLY IND984920835	P329 EADS PKWY LAWRENCEBURG IN 47025	0.00 --	9
26	FINDS	LAWRENCEBURG TOWN HALL 110011598315/FRS	405 MAIN ST LAWRENCEBURG IN 47025	0.00 --	21
28	FINDS	MOLE-MED, INC. 110010593508/FRS	515 MAIN ST. LAWRENCEBURG IN 47025	0.00 --	23
30	FINDS	OMNI TECHNOLOGIES INCORPORATED 110000493813/FRS	80 BROWN STREET GREENDALE IN 47025	0.00 --	24
32	FINDS	PIERSON HOLLOWELL CO INC IND985026491	100 BROWN ST LAWRENCEBURG IN 47025	0.00 --	18
33	FINDS	S & S SALES IND985095579	350 W EADS PKY LAWRENCEBURG IN 47025	0.00 --	12
34	FINDS	SEAGRAM JOSEPH & SONS INC IND004248357	7 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	6
35	FINDS	SEAGRAM LAWRENCEBURG DISTILLERY 110000767206/FRS	7 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	6
38	FINDS	SEAGRAM LAWRENCEBURG DISTILLERY 110012534230/FRS	2ND & SHIPPING ST LAWRENCEBURG IN 47025	0.00 --	6
40	FINDS	SPRINT 110012002974/FRS	426 MAIN ST LAWRENCEBURG IN 47025	0.00 --	27
41	FINDS	TANNERS CREEK PLANT IND985089481	PO BOX 312 1/4 MI S OF RR LAWRENCEBURG IN 47025	0.00 --	4
42	FINDS	UNITED TELEPHONE CO IND985087626	426 MAIN ST LAWRENCEBURG IN 47025	0.00 --	27
43	FINDS	LAWRENCEBURG GAS COMPANY 110000792312/FRS	336 SECOND ST LAWRENCEBURG IN 47025	0.00 --	7
45	FINDS	DOLLAR RENT A CAR 110012127340/FRS	350 W EADS PARKWAY LAWRENCEBURG IN	0.00 --	12
46	FINDS	MOLE-MED, INC. IN0002058774	515 MAIN ST. LAWRENCEBURG IN 47025	0.00 --	23
47	FINDS	AMES DEPARTMENT STORE 576 IND984908954	407 W EADS PKY LAWRENCEBURG IN 47025	0.00 --	10

Environmental FirstSearch Sites Summary Report

TARGET SITE: WELLHEAD PROTECTION
LAWRENCEBURG IN 47025

JOB: 031211

TOTAL: 370 **GEOCODED:** 135 **NON GEOCODED:** 235 **SELECTED:** 370

Page No.	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
48	FINDS	AMES DEPARTMENT STORE 576 110012007817/FRS	407 W EADS PKY LAWRENCEBURG IN 47025	0.00 --	10
49	FINDS	ANDE CHEVROLET OLDS INC IND016489148	I 275 & US 50 LAWRENCEBURG IN 47025	0.00 --	2
50	FINDS	CVS PHARMACY #6078 110003137971/FRS	229 W EADS PKWY LAWRENCEBURG IN 47025	0.00 --	3
52	FINDS	GREENDALE MUNICIPAL STP 110009738597/FRS	510 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	16
54	FINDS	DIAMOND BATHURST INC 110012082067/FRS	368 RIDGE RD LAWRENCEBURG IN 47025	0.00 --	11
55	FINDS	AMERICAN ELECTRIC POWER INC IN0002001212	I M ST LAWRENCEBURG IN 47025	0.00 --	4
56	FINDS	FIRST BAPTIST CHURCH LAWRENCEBURG IND985001437	45 TEBBS AVE GREENDALE IN 47025	0.00 --	13
57	FINDS	FIRST BAPTIST CHURCH LAWRENCEBURG 110012075949/FRS	45 TEBBS AVE GREENDALE IN 47025	0.00 --	13
58	FINDS	GAS BARN IND985052547	507 W EADS PKY LAWRENCEBURG IN 47025	0.00 --	14
59	FINDS	GAS BARN 110011980794/FRS	507 W EADS PKWY LAWRENCEBURG IN 47025	0.00 --	14
60	FINDS	GILES CHEMICAL CORP IND985053313	200 BROWN AVE LAWRENCEBURG IN 47025	0.00 --	15
61	FINDS	GILES CHEMICAL CORP 110011981294/FRS	200 BROWN AVE LAWRENCEBURG IN 47025	0.00 --	15
62	FINDS	DIAMOND BATHURST INC IN0002459998	368 RIDGE RD LAWRENCEBURG IN 47025	0.00 --	11
63	INSTCONTROL	LAWRENCEBURG GAS COMP. IC-6941101/INSTITUTIONAL CONTRO	336 SECOND ST. LAWRENCEBURG IN 47025	0.00 --	7
64	LUST	UNITED TELEPHONE CO-SPRINT 200107510	426 MAIN ST LAWRENCEBURG IN 47025	0.00 --	27
65	LUST	S & S SALES 199201548	350 W EADS PARKWAY LAWRENCEBURG IN	0.00 --	12
66	LUST	JOSEPH E. SEAGRAM & SONS INC. 198611009	7 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	6
68	LUST	JOSEPH E. SEAGRAM & SONS INC. 199111544	7 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	6
70	LUST	JOHNSON SERVICE STATION 199111526	1072 EADS PKWY LAWRENCEBURG IN 47025	0.00 --	5
71	LUST	HAAG FORD SALE INC 199812590	405 EADS PKWY E LAWRENCEBURG IN 47025	0.00 --	17

**Environmental FirstSearch
Sites Summary Report**

TARGET SITE: WELLHEAD PROTECTION
LAWRENCEBURG IN 47025

JOB: 031211

TOTAL: 370 **GEOCODED:** 135 **NON GEOCODED:** 235 **SELECTED:** 370

Page No.	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
72	LUST	GAS BARN LAWRENCEBURG 199407524	507 EADS LAWRENCEBURG IN 47025	0.00 --	35
75	LUST	DAIRYLAND FOOD MART 199206563	353 W EADS PKY LAWRENCEBURG IN 47025	0.00 --	36
77	NCDB	LAWRENCEBURG ELECTRIC DEPARTMENT NCDB-0801-034404/TSCA	405 MAIN STREET LAWRENCEBURG IN 47025	0.00 --	38
79	NPDES	IN0051543/MINOR	329 EADS PARKWAY 327 EADS P LAWRENCEBURG IN 47025	0.00 --	9
80	NPDES	PERNOD RICARD USA,SEAGRAM DIST IN0003131/MINOR	7 RIDGE AVE PERNOD RICARD U LAWRENCEBURG IN 47025	0.00 --	8
81	OTHER	TRINITY PEST CONTROL COM-AP-02390/CA	777 E EADS PKWY LAWRENCEBURG IN 47025	0.00 --	32
81	OTHER	TRINITY PEST CONTROL COM-AP-02391/CA	777 E EADS PKWY LAWRENCEBURG IN 47025	0.00 --	32
82	OTHER	HARCROS CHEMICALS INC CRTK-0503-801/CRTK	456 NOWLIN AVE LAWRENCEBURG IN 47025	0.00 --	31
82	OTHER	LAWRENCEBURG GAS COMP. 6941101/CNTS - A COVENANT NO	336 SECOND ST. LAWRENCEBURG IN	0.00 --	7
83	OTHER	PERNOD RICHARD USA CRTK-0503-808/CRTK	7 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	6
83	OTHER	SPRINT COMMUNICATIONS COMPANY LP CRTK-0503-804/CRTK	426 MAIN ST LAWRENCEBURG IN 47025	0.00 --	27
84	PADS	LAWRENCEBURG MUNI UTIL IND984875948/PCB ACTIVITY	4TH & SHIPPING STS ELEC DEP LAWRENCEBURG IN	0.00 --	39
85	PADS	LAWRENCEBURG MUNICIPAL UTIL IN0000332353/PCB ACTIVITY	405 MAIN ST, PO BOX 112 LAWRENCEBURG IN 47025	0.00 --	21
86	PADS	INDIAN MICHAGAN POWER COMPANY TRD-1618/TRANSFORM REG	TANNERS CREEK PLANT AEP STR LAWRENCEBURG IN 47025	0.00 --	4
87	PADS	INDIANA MICHIGAN POW TANNERS IND000815878/PCB ACTIVITY	TANNERS CREEK PLT I & M ST LAWRENCEBURG IN 47025	0.00 --	4
88	RCRAGN	ANDE CHEVROLET OLDS INC IND016489148/VGN	1105 E EADS PKWY (US 50) LAWRENCEBURG IN 47025	0.00 --	2
89	RCRAGN	CVS PHARMACY #6078 INR000100529/SGN	229 W EADS PKWY LAWRENCEBURG IN 47025	0.00 --	3
91	RCRAGN	IND MI POWER TANNERS CREEK PLT IND000815878/VGN	800 AEP ST LAWRENCEBURG IN 47025	0.00 --	4
94	RCRAGN	JOHNS BODY SHOP IND982422966/VGN	1072 E EADS PKWY LAWRENCEBURG IN 47025	0.00 --	5
96	RCRAGN	SEAGRAM LAWRENCEBURG DISTILLERY IND004248357/SGN	7 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	6

Environmental FirstSearch Sites Summary Report

TARGET SITE: WELLHEAD PROTECTION
LAWRENCEBURG IN 47025

JOB: 031211

TOTAL: 370 **GEOCODED:** 135 **NON GEOCODED:** 235 **SELECTED:** 370

Page No.	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
98	RCRAGN	SEAGRAM LAWRENCEBURG DISTILLERY INR000016311/SGN	2ND & SHIPPING ST LAWRENCEBURG IN 47025	0.00 --	6
100	RCRANLR	IND MICH PWR TANNER CREEK PLT IND000815878/NLR	I AND M ST LAWRENCEBURG IN 47025	0.00 --	4
101	RCRANLR	LAWRENCEBURG GAS CO IN0000596031/NLR	336 SECOND ST LAWRENCEBURG IN 47025	0.00 --	7
102	RELEASES	N/A NRC-524842/VESSEL	777 EADS PARKWAY LAWRENCEBURG IN 47025	0.00 --	32
105	RELEASES	NRC-601003/FIXED	I AND M STREET LAWRENCEBURG IN 47025	0.00 --	4
106	RELEASES	INDIANA-MICHIGAN POWER CO 396094/FIXED FACILITY	I AND M ST OHIO RIVER MILE LAWRENCEBURG IN	0.00 --	4
107	RELEASES	MILE 494 OHIO RIVER NRC-715576/VESSEL	TANNERS CREEK POWER LAWRENCEBURG IN	0.00 --	4
110	RELEASES	JOSEPH E. SEAGRAM & SONS 596579/FIXED FACILITY	7 RIDGE AVENUE LAWRENCEBURG IN 47025	0.00 --	6
111	RELEASES	JOSEPH E. SEAGRAM & SONS 331821/HIGHWAY RELATED	7 RIDGE AVE SOUTH WEST CORN LAWRENCEBURG IN 47025	0.00 --	8
112	RELEASES	JOSEPH E SEAGRAM & SONS 398004/FIXED FACILITY	7 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	6
113	RELEASES	INDIANA-MICHIGAN POWER CO 452560/FIXED FACILITY	I&M STREET MILE MARK 494 RI LAWRENCEBURG IN 46801	0.00 --	4
114	RELEASES	INDIANA-MICHIGAN POWER CO 283211/UNKNOWN (NRC)	TANNER S CREEK GENERATING P LAWRENCEBURG IN 46801	0.00 --	4
115	RELEASES	HYDRITE CHEMICAL CO. 235607/FIXED FACILITY	200 BROWN STREET GREENDALE IN	0.00 --	37
116	RELEASES	JOSEPH E SEAGRAM & SONS 396619/FIXED FACILITY	7 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	6
117	SPILLS	OTHER 200006253	425 SHELDON ST. LAWRENCEBURG IN 47025	0.00 --	30
118	SPILLS	INDUSTRIAL 199308075	201 LAWRENCE ST GREENDALE IN 47558	0.00 --	29
119	SPILLS	INDUSTRIAL 199809223	7 RIDGE ROAD(OFFLOADING PAD LAWRENCEBURG IN 47205	0.00 --	6
120	SPILLS	INDUSTRIAL 199912138	TANNERS CREEK POWER STATION LAWRENCEBURG IN 47025	0.00 --	4
121	SPILLS	INDUSTRIAL 200205002	7 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	6
122	SPILLS	INDIVIDUAL 200407185	777 ARGOSY PARKWAY LAWRENCEBURG IN 47025	0.00 --	28

Environmental FirstSearch Sites Summary Report

TARGET SITE: WELLHEAD PROTECTION
LAWRENCEBURG IN 47025

JOB: 031211

TOTAL: 370 **GEOCODED:** 135 **NON GEOCODED:** 235 **SELECTED:** 370

Page No.	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
123	SPILLS	INDIVIDUAL 200102051	507 W EADS PARKWAY LAWRENCEBURG IN 47025	0.00 --	14
124	SPILLS	COMMERCIAL 199710098	7 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	6
125	SPILLS	COMMERCIAL 199402070	507 W EADS PARKWAY LAWRENCEBURG IN 47025	0.00 --	14
126	SPILLS80	INDUSTRIAL 198910078	7 RICH AVE LAWRENCEBURG IN 47025	0.00 --	6
127	STATE	LAWRENCEBURG GAS (CNTS) 6941101	336 SECOND ST. LAWRENCEBURG IN 47025	0.00 --	7
127	TRIS	JOSEPH E. SEAGRAM & SONS INC. IND004248357/OPEN	7 RIDGE AVE. LAWRENCEBURG IN 47025	0.00 --	6
128	TRIS	OMNI TECHNOLOGIES INC 47025MNTCH80BRO/OPEN	80 BROWN ST GREENDALE IN 47025	0.00 --	24
129	TRIS	JOSEPH E. SEAGRAM & SONS INC. 47025JSPHS7RIDG/OPEN	7 RIDGE AVE. LAWRENCEBURG IN 47025	0.00 --	6
130	UST	ANDE CHEVROLET-OLDS INC 894	I-275 & US 50 LAWRENCEBURG IN 47025	0.00 --	2
130	UST	S & S SALES 20268	350 W EADS PARKWAY LAWRENCEBURG IN	0.00 --	12
131	UST	CITY OF LAWRENCEBURG 19228	405 MAIN ST LAWRENCEBURG IN 47025	0.00 --	21
132	UST	SPRINT 22810	426 MAIN ST LAWRENCEBURG IN 47025	0.00 --	27
132	UST	PIERSON-HOLLOWELL CO INC 15820	100 BROWN ST GREENDALE IN 47025	0.00 --	18
133	UST	MEYER BROS GARAGE LOUIS J MEYER 14996	548 MAIN ST LAWRENCEBURG IN 47025	0.00 --	19
134	UST	AMES STORE #576 17706	407 W EADS PKWY LAWRENCEBURG IN 47025	0.00 --	10
135	UST	KENNETT TRUCK STOP 11852	1049 EADS PKWY LAWRENCEBURG IN 47025	0.00 --	20
138	UST	JOSEPH E. SEAGRAM & SONS INC. 14797	7 RIDGE AVE LAWRENCEBURG IN 47025	0.00 --	6
140	UST	JOHNSON SERVICE STATION 4780	1072 EADS PKWY LAWRENCEBURG IN 47025	0.00 --	5
141	UST	HAAG FORD SALE INC 13918	405 EADS PKWY E LAWRENCEBURG IN 47025	0.00 --	17
142	UST	GAS BARN LAWRENCEBURG 15493	507 EADS LAWRENCEBURG IN 47025	0.00 --	35

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Page No.	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
144	UST	FIRST BAPTIST CHURCH LAWRENCEBURG 14828	45 TEBBS AVE GREENDALE IN 47025	0.00 --	34
144	UST	UNITED TELEPHONE CO-SPRINT 6646	426 MAIN ST LAWRENCEBURG IN 47025	0.00 --	27
145	VCP	LAWRENCEBURG GAS COMP. VRP-6941101/CNTS	336 SECOND ST. LAWRENCEBURG IN 47025	0.00 --	7
146	FINDS	SOUTH DEARBORN SEWAGE TREATMENT PL 110006645764/FRS	108 FRONT STREET LAWRENCEBURG IN 47025	0.05 NE	26
148	LUST	COST & LIQUOR 199103544	US 50 & FRONT ST LAWRENCEBURG IN	0.05 NE	33
149	UST	SOUTH DEARBORN SEWER DISTRICT 22571	108 FRONT ST LAWRENCEBURG IN 47025	0.05 NE	26
149	UST	SEE FAC ID 14573 21072	HWY 50 & FRONT ST LAWRENCEBURG IN	0.05 NE	33
150	UST	COST & LIQUOR 14573	US 50 & FRONT ST LAWRENCEBURG IN	0.05 NE	33
151	FINDS	PRI-PAK, INC. 110006679763/FRS	2000 SCHENLEY PLACE LAWRENCEBURG IN 47025	0.05 SW	25
153	RELEASES	NRC-538869/FIXED	2000 SCHENLEY PLACE LAWRENCEBURG IN 47025	0.05 SW	25
156	SPILLS	INDUSTRIAL 200001116	2000 SHENLEY PLACE LAWRENCEBURG IN 47025	0.05 SW	25
157	SPILLS	INDUSTRIAL 200002079	2000 SHENLEY PLACE LAWRENCEBURG IN 47025	0.05 SW	25
158	SPILLS	INDUSTRIAL 199908095	2000 SHENLEY PLACE GREENDALE IN 47025	0.05 SW	25
159	SPILLS	INDUSTRIAL 200008123	2000 SHENLEY PLACE LAWRENCEBURG IN 47025	0.05 SW	25

Environmental FirstSearch Sites Summary Report

TARGET SITE: WELLHEAD PROTECTION
LAWRENCEBURG IN 47025

JOB: 031211

TOTAL: 370 **GEOCODED:** 135 **NON GEOCODED:** 235 **SELECTED:** 370

Page No.	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
160	AIRS	DEARBORN GRAVEL RR 2 BOX 26 IN0255774/AIRS DATABASE	RR 2 LAWRENCEBURG IN 47025	NON GC	
160	AIRS	GIBBCO, INCORPORATED IN0087660/AIRS DATABASE	WEST HIGH STREET LAWRENCEBURG IN 47025	NON GC	
161	AIRS	INDIANA MICHIGAN POWER (DBA AEP) - IN0087644/AIRS DATABASE	I&M STREET LAWRENCEBURG IN 47025	NON GC	
161	AIRS	BABCOCK & WILCOX CON IN0761841/AIRS DATABASE	P O BOX 191 LAWRENCEBURG IN 47025	NON GC	
162	AIRS	UNITED ASPHALT CORP IN0761912/AIRS DATABASE	1.7 MI E US 50 & US 50 CONN LAWRENCEBURG IN 47025	NON GC	
162	AIRS	CARBONIC INDUSTRIES CORP. IN0087661/AIRS DATABASE	N. FRONT & SIXTH STREET GREENDALE IN 47025	NON GC	
163	CERCLIS	LAWRENCEBURG TANKER SPILL INN000508602/NOT PROPOSED	U.S. 50 AND TANNERS CREEK LAWRENCEBURG IN 47025	NON GC	
163	DOCKET	INDIANA MICHIGAN POWER(AMERICAN EL 05-1999-0112/ICIS	I&M ST LAWRENCEBURG IN 47025	NON GC	
164	ERNS	TANNERS CREEK UNITS NO. 1,2 AND 3 NRC-522762/CONTINUOUS	AEP DR. LAWRENCEBURG IN 47025	NON GC	
168	ERNS	ARGOSY 526625/UNKNOWN	CASINO DOCK OHIO RIVER MM49 LAWRENCEBURG IN	NON GC	
168	ERNS	GIBBCO INC 527410/UNKNOWN	INDIANA & MICHIGAN ST LAWRENCEBURG IN 47025	NON GC	
169	ERNS	TANNERS CREEK UNIT NO.4 NRC-522765/CONTINUOUS	AEP DR. LAWRENCEBURG IN 47025	NON GC	
173	ERNS	522039/UNKNOWN	I-275 BRIDGE AT THE IN-KY S LAWRENCEBURG IN	NON GC	
173	ERNS	M/V ARGOSY 6 588943/UNKNOWN	OHIO RIVER MILE 493 RDB LAWRENCEBURG IN	NON GC	
174	FINDS	GIBBCO INCORPORATED 110007282733/FRS	TANNERS CREEK RD LAWRENCEBURG IN 47025	NON GC	
176	FINDS	TRI TOWNSHIP WATER CORP IND985094291	MORGAN RD BRIGHT IN 47025	NON GC	
177	FINDS	COUNTRY SQUIRE LAKE CSL SERV IN0001757962	COUNTRY RD 300 N APP 2 MI W LAWRENCEBURG IN 47025	NON GC	
178	FINDS	DEARBORN GRAVEL RR 2 BOX 26 110012598313/FRS	RR 2 LAWRENCEBURG IN 47025	NON GC	
179	FINDS	DEARBORN SWITCHING STATION IND984938217	I & M ST LAWRENCEBURG IN 47025	NON GC	
180	FINDS	DONE RIGHT TRANSMISSION SVC 110012113079/FRS	45 US 50 E LAWRENCEBURG IN 47025	NON GC	

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: WELLHEAD PROTECTION
LAWRENCEBURG IN 47025

JOB: 031211

FINDS SITE

SEARCH ID: 17

DIST/DIR: 0.00 --

MAP ID: 10

NAME: AMES DEPARTMENT STORE 576
ADDRESS: 407 W EADS PKY
LAWRENCEBURG IN 47025

REV:
ID1: IND984908954
ID2:
STATUS:
PHONE:

CONTACT:

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: WELLHEAD PROTECTION
LAWRENCEBURG IN 47025

JOB: 031211

FINDS SITE

SEARCH ID: 19

DIST/DIR: 0.00 --

MAP ID: 2

NAME: ANDE CHEVROLET OLDS INC
ADDRESS: I 275 & US 50
LAWRENCEBURG IN 47025

REV:
ID1: IND016489148
ID2:
STATUS:
PHONE:

CONTACT:

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: WELLHEAD PROTECTION
LAWRENCEBURG IN 47025

JOB: 031211

STATE SPILLS SITE

SEARCH ID: 76

DIST/DIR: 0.00 --

MAP ID: 30

NAME: OTHER
ADDRESS: 425 SHELDON ST.
LAWRENCEBURG IN 47025

REV: 10/3/06
ID1: 200006253
ID2:
STATUS:
PHONE:

CONTACT:

SITE INFORMATION

INCIDENT DATE/TIME: 6/24/2000 12:59:00 PM
REPORTED DATE/TIME: 6/24/2000 12:59:00 PM

SPILL TYPE: OTHER

REC WATER:		AREA AFFECTED:	CITIZEN S HOME
WATER SUPPLY AFFECTED:	NO	PUBLIC INTAKE:	
NUMBER OF FISH KILLED		MATERIAL:	UNKNOWN
SPILL AMOUNT:		SPILLED UNITS:	
RECOVERED AMOUNT:		RECOVERED UNITS:	
CONTAINED:		CLEANUP DURATION:	

SOURCE DESCRIPTION: OTHER

ENFORCEMENT DESCRIPTION:

Environmental FirstSearch Database Descriptions

NPL: *EPA* NATIONAL PRIORITY LIST - Database of confirmed and proposed Superfund sites.

NPL Delisted: *EPA* NATIONAL PRIORITY LIST Subset - Database of delisted Superfund sites.

CERCLIS: *EPA* COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY INFORMATION SYSTEM - Database of current and potential Superfund sites currently or previously under investigation.

NFRAP: *EPA* COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY INFORMATION SYSTEM ARCHIVED SITES - database of Archive designated CERCLA sites that, to the best of EPA's knowledge, assessment has been completed and has determined no further steps will be taken to list this site on the National Priorities List (NPL). This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

RCRA COR ACT: *EPA* RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM SITES - Database of RCRA facilities with reported violations and subject to corrective actions.

RCRA TSD: *EPA* RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM TREATMENT, STORAGE, and DISPOSAL FACILITIES. - Database of facilities licensed to store, treat and dispose of hazardous waste materials.

RCRA GEN: *EPA* RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM SITES - Database of facilities that generate or transport hazardous waste or meet other RCRA requirements.

LGN - Large Quantity Generators

SGN - Small Quantity Generators

VGN - Conditionally Exempt Generator.

Included are RAATS (RCRA Administrative Action Tracking System) and CMEL (Compliance Monitoring & Enforcement List) facilities.

RCRA NLR: *EPA* RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM SITES - Database of facilities not currently classified by the EPA but are still included in the RCRIS database. Reasons for non classification:

Failure to report in a timely matter.

No longer in business.

No longer in business at the listed address.

No longer generating hazardous waste materials in quantities which require reporting.

Federal IC / EC: *EPA* BROWNFIELD MANAGEMENT SYSTEM (BMS) - database designed to assist EPA in collecting, tracking, and updating information, as well as reporting on the major activities and accomplishments of the various Brownfield grant Programs.

FEDERAL ENGINEERING AND INSTITUTIONAL CONTROLS- Superfund sites that have either an engineering or an institutional control. The data includes the control and the media contaminated.

ERNS: *EPA/NRC* EMERGENCY RESPONSE NOTIFICATION SYSTEM - Database of emergency response actions. Data since January 2001 has been received from the National Response System database as the EPA no longer maintains this data.

Tribal Lands: *DOI/BIA* INDIAN LANDS OF THE UNITED STATES - Database of areas with boundaries established by treaty, statute, and (or) executive or court order, recognized by the Federal Government as territory in which American Indian tribes have primary governmental authority. The Indian Lands of the United States map layer shows areas of 640 acres or more, administered by the Bureau of Indian Affairs. Included are Federally-administered lands within a reservation which may or may not be considered part of the reservation.

State/Tribal Sites: *IN DEM* HAZARDOUS WASTE INVENTORY SITE LISTING - database of hazardous waste sites that have made the states inventory list. The data includes score, score date, contamination type, and media affected

State Spills 90: IN DEM SPILLS REPORT - database of all spills reported to the IDEM . Includes such data as location, material, quantity and environmental impact.

State/Tribal SWL: IN DEM PERMITTED SOLID WASTE FACILITIES LIST - database of permitted landfills and transfer stations

State/Tribal LUST: IN DEM LEAKING UNDERGROUND STORAGE TANK REPORT - database of all open, closed, and deactivated underground storage tanks in the Department of Environmental Management database.

State/Tribal UST/AST: IN DEM UNDERGROUND STORAGE TANK REPORT - database of all underground storage tanks registered with the Department of Environmental Management.

State/Tribal IC: IN DEM VRP PROJECT SITE LIST(SUBSET) – database of VRP sites that have land-use restriction/institutional controls

BRONFIELDS PROGRAM COMFORT AND SITE STATUS(Subset) – database of comfort/site status letter sites that have deed restrictions or institutional controls.

State/Tribal VCP: IN DEM VRP PROJECT SITE LIST – Database of voluntary remediation projects. The data includes applicants name and site location data. Also includes dates for certificates of completion and land-use restrictions/institutional controls.

State/Tribal Brownfields: IN DEM BROWNFIELD PROGRAM SITE LISTING - database of sites that are receiving assistance through the State Brownfield Program and reflects services in progress as well as those that have been completed

Receptors: US DOC SENSITIVE RECEPTORS - 2002 Census Bureau's TIGER (Topologically Integrated Geographic Encoding and Referencing System) database of schools and hospitals. List of schools and hospitals that may house individuals deemed sensitive to environmental discharges due to their fragile immune systems.

NPDES: EPA THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM - Database of permitted facilities receiving and discharging effluents to and from a natural source where treatment of the effluent is monitored.

FINDS: EPA FACILITY INDEX SYSTEM(FINDS)/FACILITY REGISTRY SYSTEM(FRS) - The index of identification numbers associated with a property or facility which the EPA has investigated or has been made aware of in conjunction with various regulatory programs. Each record indicates the EPA office that may have files on the site or facility. A Facility Registry System site has an FRS in the status field.

TRIS: EPA TOXIC RELEASE INVENTORY SYSTEM - Database of all facilities that have had or may be prone to toxic material releases.

HMIRS: US DOT HAZARDOUS MATERIALS INCIDENT RESPONSE SYSTEM - Database of information regarding materials, packaging, and a description of events for tracked incidents.

NCDB: EPA NATIONAL COMPLIANCE DATA BASE SYSTEM - Database of regional compliance and enforcement activity and manages the Pesticides and Toxic Substances Compliance and Enforcement program at a national level. The system tracks all compliance monitoring and enforcement activities from the time an inspector conducts and inspection until the time the inspector closes or the case settles the enforcement action. NCDB is the national repository of the 10 regional and Headquarters FIFRA/TSCA Tracking System (FTTS). Data collected in the regional FTTS is transferred to NCDB to support the need for monitoring national performance of regional programs.

PADS: EPA DATABASE OF PCB HANDLERS - Database of PolyChlorinatedBiPhenol generators, transporters, storers and/or disposers that are required to register with the EPA. This database indicates the type of handler and registration number. Also included is the PCB Transformer Registration Database.

AIRS: EPA AEROMETRIC INFORMATION RETRIEVAL SYSTEM (AIRS) – database of detailed information pertaining to sites which submit air emissions reports. Developed under the Clean Air Act, this database also maintains data on compliance status and enforcement actions.

RADON: *NTIS* NATIONAL RADON DATABASE - EPA radon data from 1990-1991 national radon project collected for a variety of zip codes across the United States.

DOCKET: *EPA* INTERGRATED COMPLIANCE INFORMATION SYSTEM (ICIS) - database of federal administrative and federal judicial cases under the following environmental statutes: the Clean Air Act (CAA), the Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA), the Emergency Planning and Community Right-to-Know Act (EPCRA) Section 313, the Toxic Substances Control Act (TSCA), the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), the Safe Drinking Water Act (SDWA), and the Marine Protection, Research, and Sanctuaries Act (MPRSA).

Nuclear Permits: *EPA/NRC* PERMITTED NUCLEAR FACILITIES

THE RADINFO DATABASE - Database of basic information about facilities that are permitted and regulated for their use and handling of radioactive materials.

Federal Other: *EPA* SECTION SEVEN TRACKING SYSTEM (SSTS) – database of registration and production data for facilities which manufacture pesticides.

SETS PRP: *EPA* POTENTIALLY RESPONSIBLE PARTIES (PRP) – database of parties identified by the EPA as being potential responsible for contamination at a CERCLIS or NPL site.

State Other: *IDEM* MARION COUNTY POTENTIAL GROUNDWATER POLLUTERS DATABASE - database of potential polluters in Marion Count. This database is static.

COMMUNITY RIGHT TO KNOW(CRTK)- database of all CRTK facilities in the IDEM database that have submitted Tier II forms for 2001 and 2002.

SEED COMMISSIONER'S DATABASE OF PESTICIDES- database of commercial applicators and restricted use dealers of pesticides for the state of Indiana

APPENDIX D
LOCAL PLANNING TEAM DOCUMENTATION

Lawrenceburg Utilities 4/26/07 To: Dearborn County Register Dr.
(Governmental Unit) Public Meeting
Dearborn County, Indiana

Lawrenceburg, Indiana 47025

LINE COUNT

PUBLISHER'S CLAIM

Fed. I.D. #35-1869520
Acct. #15001

Display Matter (Must not exceed two actual lines, neither of which shall total more than four solid lines of type in which the body of the advertisement is set) - number of equivalent lines	<u>4</u>
Head - number of lines	_____
Body - number of lines	_____
Tail - number of lines	_____
Total number of lines in notice	<u>4</u>

COMPUTATION OF CHARGES

<u>4</u> lines, <u>1</u> columns wide equals <u>4</u> equivalent lines	
at <u>1.196</u> cents per line	\$ <u>4.78</u>
Additional charge for notices containing rule or tabular work (50 percent of above amount)	\$ _____
Charge for extra proofs of publication (\$1.00 for each proof in excess of two)	\$ _____
TOTAL AMOUNT OF CLAIM	\$ <u>4.78</u>

DATA FOR COMPUTING COST

Width of single column 9.6 ems
 Number of insertions 2
 Size of type 6 point

Pursuant to the provisions and penalties of Chapter 155, Acts 1953,

I hereby certify that the foregoing account is just and correct, that the amount claimed is legally due, after allowing all just credits, and that no part of the same has been paid.

Joseph M. Awad

Date: April 19, 2007 Title: _____ Publisher

PROOF OF PUBLICATION/PUBLISHER'S AFFIDAVIT

State of Indiana)
) ss:
Dearborn County)

Personally appeared before me, a notary public in and for said county and state, the undersigned Joseph M. Awad who, said duly sworn, says that he is Publisher of the Dearborn County Register newspaper of general circulation printed and published in the English language in

Head - number of lines
 Body - number of lines
 Tail - number of lines
 Total number of lines in notice 4

COMPUTATION OF CHARGES

4 lines, 1 columns wide equals 4 equivalent lines
 at 1.196 cents per line \$ 4.78
 Additional charge for notices containing rule or tabular work
 (50 percent of above amount) \$
 Charge for extra proofs of publication (\$1.00 for each proof
 in excess of two)
 TOTAL AMOUNT OF CLAIM \$ 4.78

DATA FOR COMPUTING COST

Width of single column 9.6 ems
 Number of insertions 2
 Size of type 6 point

Pursuant to the provisions and penalties of Chapter 155, Acts 1953,

I hereby certify that the foregoing account is just and correct, that the amount claimed is legally due, after allowing all just credits, and that no part of the same has been paid.

Date: April 19, 2007 Title: _____ Publisher _____

PROOF OF PUBLICATION/PUBLISHER'S AFFIDAVIT

State of Indiana)
) ss:
Dearborn County)

Personally appeared before me, a notary public in and for said county and state, the undersigned Joseph M. Awad who, said duly sworn, says that he is Publisher of the Dearborn County Register newspaper of general circulation printed and published in the English language in (town) of Lawrenceburg in the state and county afore- that the printed matter attached hereto is a true copy, duly published in said paper for 2 time 5, the publication being as follows:

April 12 & 19
Joseph M. Awad

Subscribed and sworn to before me this 19 day of April, 2007
Yvonne D. Waters
 Yvonne D. Waters, Notary Public

My commission expires: 5-30-13



OK
 CMD
 Water

City of Lawrenceburg

Wellhead Protection Plan

Public Meeting Sign in Sheet

Local Planning Team Formation

April 26, 2007

Please check box
at right if you wish
to participate on the
Local Planning Team

Name / Phone No. / Affiliation

MIKE CLARK (812) 532-3554 L-BURG ADVISORY P. C.

Mel Davis 812 532 3500 Utility Director

KARL CORWETT 812-537-3418

RANDY ARNOLD 812-537-1509 FIRE CHIEF

Steve Lampert 812-537-2125 City of Greendale

Jim Carr 317 286-8915 Hydrophase, Inc.

APPENDIX E
MONITORING SCHEDULE

STANDARDIZED MONITORING FRAMEWORK 1 (SMF 1)

Without Exceeding the Detection Limits, Maximum Contaminant Levels, or Action Levels

System Name: Lawrenceburg Municipal Utilities Entry Point: 01 PWSID# 5215006

REGULATED Contaminants	First Compliance Period			Second Compliance Period			Third Compliance Period		
	2002	2003	2004	2005	2006	2007	2008	2009	2010
VOCs	Annual			Annual			Annual		
SOCs		2nd & 3rd Qtr			2nd & 3rd Qtr			2nd & 3rd Qtr	
IOCs	Annual			Annual			Annual		
Asbestos									
PCBs & Dioxin									
Nitrate	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
Cyanide & Glyphosate									

Please contact the Drinking Water Branch at 317/308-3282 if you have any detections or exceed a maximum contaminant level.

Other Monitoring Requirements	2002			2003			2004			2005			2006			2007			2008			2009			2010					
	Bacteriological	6 per month			6 per month																									
Sodium	Annual																													
Lead & Copper	20 samples between June & September			20 samples between June & September			20 samples between June & September			20 samples between June & September			20 samples between June & September			20 samples between June & September			20 samples between June & September			20 samples between June & September			20 samples between June & September			20 samples between June & September		
TTHM & HAA5	Annual			1/plant/year *																										
Radionuclides	Annual																													
CCR	Due by 7/1																													

* Collect during the warmest month of the year.

APPENDIX F
RECORD UPDATES

APPENDIX G

WELL ABANDONMENT REQUIREMENTS

Title 312 Indiana Administrative Code (Rules)
ARTICLE 13. WATER WELL DRILLERS

Rule 1. Definitions

312 IAC 13-1-1 General application of definitions

Sec. 1. The definitions in this rule are in addition to those contained in IC 25-39-2 and 312 IAC 1 and apply throughout this article. *[Definitions from IC 25-39-2 and 312 IAC 1 are included as a supplement on p. 20.]*

Sec. 2. “**Abandon**” means to terminate operations of a well for water supply, monitoring, dewatering, or geothermal purposes and to restore the site of the well in a manner that will protect ground water resources from contamination.

Sec. 3. “**Aquifer characteristics**” refers to the type, thickness, transmissivity, coefficient of storage, and materials of a water-bearing unit.

Sec. 4. “**Bentonite**” means clay material composed predominantly of sodium montmorillonite that meets American Petroleum Institute specifications Standard 13-A (1985).

Sec. 5. “**Bentonite slurry**” means a mixture, made according to manufacturer specifications, of water and commercial grouting or plugging bentonite that contains high concentrations of solids. The term does not include sodium bentonite products that contain low *concentrations of solids* or are designed for drilling fluid purposes.

Sec. 6. “**Bridge**” means a barrier created by any unwanted object or material that prevents the introduction of grouting materials in the borehole or well.

Sec. 7. “**Coarse grade crushed bentonite**” means natural bentonite crushed to an average size range of three-eighths (3/8) to three-fourths (3/4) inches.

Sec. 8. “**Competency examination**” means an examination given by the department that is designed to establish the capability and skill of an individual to operate as a water well driller.

Sec. 9. “**Confined aquifer**” means an aquifer that contains sufficient hydrostatic head to cause ground water to rise above the upper boundary of the aquifer.

Sec. 10. “**Contamination**” means the degradation of natural water quality as a result of human activities.

Sec. 11. “**Dewatering well**” means a temporary water well that—

- (1) is used as part of a construction project to remove water from a surface or subsurface area; and
- (2) ceases to be used upon completion of the construction project or shortly after completion of the project.

Sec. 12. “**Disinfection**” means the process of destroying pathogenic micro-organisms, such as coliform bacteria.

Sec. 13. “**Division**” means the Division of Water of the Department of *Natural Resources*.

Sec. 14. “**Drawdown**” means the amount of lowering of the water level in a well resulting from the discharge of water by pumping from the well.

Sec. 15. “**Grout pipe**” means a length of hose or pipe positioned in the annular space of a well, between the well casing and the borehole, used for the introduction of grouting materials.

Sec. 16. “**High capacity water well**” means a well that has the capability of withdrawing one hundred thousand (100,000) gallons of ground water or more in one (1) day.

Sec. 17. “**Medium grade crushed bentonite**” means natural bentonite crushed to an average size range of one-fourth (1/4) to three-eighths (3/8) inch.

Sec. 18. “**Monitoring well**” means a well installed to obtain hydrogeological information or to monitor the quality or quantity of ground water.

Sec. 19. “**Operating well drilling equipment**” means *using* equipment to drill a well.

Sec. 20. “**Public water supply well**” means a well that provides a source of water to a community water system that—

(1) serves a residential population; and

(2) is defined as having fifteen (15) or more service connections or serving at least twenty-five (25) year-round residents.

Sec. 21. “**Reference**” means a person who attests to the character and professional qualifications of an applicant for a license.

Sec. 22. “**Regulatory flood**” has the meaning set forth in 310 IAC 6-1-3(32). *[This is sometimes referred to as the one hundred (100) year frequency flood, which is a flood having a probability of occurrence of one percent (1%) in any given year.]*

Sec. 23. “**Thermoplastic pipe**” means plastic well pipe made of acrylonitrile butadiene styrene, polyvinyl chloride, or rubber-modified polystyrene with standards listed in American Society of Testing Materials.

Sec. 24. “**Unconsolidated formation**” means geologic material or deposits overlying bedrock, such as sand, gravel, and clay.

Sec. 25. “**Well pit**” means a subsurface excavation that contains a well.

Rule 2. Drilling License and Well Records

312 IAC 13-2-1 Application form

Sec. 1. (a) An initial application for a license as a water well driller must be completed on a departmental form and must include the following:

(1) The name, current address, telephone number, and birth date of the applicant.

(2) The type of drilling equipment the applicant uses, and the number of years the applicant has operated that type of equipment.

(3) The applicable employment experience of the applicant.

(4) The signature of the applicant attesting to or affirming the accuracy of the information on the application.

(5) The license fee established under section 2 of this rule.

(6) Statements by references under IC 25-39-3-3(a)(2).

(b) Subsequent applications must provide what is required in subsection (a)(1), (a)(4), and (a)(5).

312 IAC 13-2-2 License fee; duplicate license

Sec. 2. (a) The fee to accompany any application for a license as a water well driller is one hundred dollars (\$100) for a calendar year.

(b) A person who is issued a license as a water well driller may apply to the department for a duplicate license (which is effective during the same calendar year) if the original license is lost, stolen, destroyed, or otherwise becomes unavailable to the driller.

Rule 10. Landowner Responsibility for Abandonment and Plugging of Wells

312 IAC 13-10-1 Temporary abandonment of wells

Sec. 1. A well which has not been used for more than three (3) months without being permanently abandoned must be sealed at or above the ground surface by a welded, threaded, or mechanically attached watertight cap. The well shall be maintained so that *it* does not become a source or channel of ground water contamination.

312 IAC 13-10-2 Permanent abandonment of wells

Sec. 2.

Wells abandoned before January 1, 1988

(a) A well abandoned before January 1, 1988, must be sealed at or above the ground surface by a welded, threaded, or mechanically attached watertight cap. The well shall be maintained so *that it* does not become a source or channel of ground water contamination. A well that poses a hazard to human health must also be plugged under subsection (c).

A **cased or uncased bucket well or a hand dug well** (other than buried slab construction) that was abandoned before January 1, 1988, shall be closed in conformance with one of the following procedures:

- (1) Covered with a reinforced concrete slab at least four (4) inches thick and having a diameter larger than the nominal diameter of the borehole or the well casing.
- (2) Equipped with a properly reinforced cover constructed of pressure treated lumber that has dimensions larger than the nominal diameter of the borehole or well casing. The cover shall be protected against water with roofing or other water-repelling materials that are properly maintained to ensure the integrity of the cover. Closure shall not be performed under this subdivision, however, if the cover is in direct contact with ground water or surface water.
- (3) Closed as otherwise approved by the division.

Wells drilled before January 1, 1988, and abandoned before January 1, 1994

(b) A well drilled before January 1, 1988, and abandoned before January 1, 1994, shall be sealed at or above the ground surface by a welded, threaded, or mechanically attached watertight cap. The well shall be maintained so *that it* does not become a source or channel of ground water contamination. A well that poses a hazard to human health must also be plugged under subsection (c).

Wells abandoned after December 31, 1987

(c) A well abandoned after December 31, 1987, shall be plugged with an impervious grouting material to prevent the migration of materials or fluids in the well and the loss of pressure in a confined aquifer.

(d) A well drilled after December 31, 1987, and **not equipped with casing** must be plugged within seventy-two (72) hours after completion.

(e) This subsection applies to a cased or uncased well abandoned after December 31, 1987:

- (1) The **plugging material** must consist of one or a combination of the following:
 - (A) Neat cement with not more than five percent (5%) by weight of bentonite additive.
 - (B) Bentonite slurry (which can include polymers designed to retard swelling).
 - (C) Pelletized *or* medium grade or coarse grade crushed bentonite.
 - (D) Other materials approved by the commission.
- (2) The following **methods** apply:
 - (A) Cement and bentonite slurries shall be pumped into place in a continuous operation with a grout pipe introducing the plugging material at the bottom of the well and moving the pipe progressively upward as the well is filled.
 - (B) Plugging materials other than neat cement or bentonite slurry shall be installed in a manner to prevent bridging of the well or borehole. The well or borehole shall be measured periodically throughout the plugging process to ensure that bridging does not occur.
- (3) The following **procedures** apply:
 - (A) An abandoned well shall be disconnected from the water system. Any substance that may interfere with plugging shall be removed, if practicable.
 - (B) A well (other than a monitoring well, a dewatering well, or an uncased borehole) shall be chlorinated before abandonment as provided in 312 IAC 13-9-1.
- (4) A **cased well** shall be plugged as follows:
 - (A) With neat cement, bentonite slurry, or medium grade or coarse grade crushed or pelletized bentonite from the bottom of the well to within two (2) feet below the ground surface, unless otherwise provided by the department.
 - (B) The well casing shall be severed at least two (2) feet below the ground surface, and a cement plug larger in diameter than the borehole shall be constructed over the borehole and covered with natural clay material to the ground surface.
- (5) An **uncased well** (other than a borehole drilled by a bucket rig or a dewatering well governed by subdivision (8) or (9)), shall be filled with natural clay materials, neat cement, bentonite slurry, or medium grade or coarse grade crushed or pelletized bentonite from the bottom of the borehole to a depth of no less than twenty-five (25) feet below ground surface. The borehole shall be filled with neat cement or medium grade or coarse grade crushed or pelletized bentonite from a depth no less than twenty-five (25) feet below ground surface to within two (2) feet below ground surface. The remaining borehole shall be filled with natural clay material to *the* ground surface.
- (6) A **cased or uncased monitoring well** shall be plugged from the bottom of the well or borehole to the ground surface with a bentonite slurry or pelletized or coarse grade crushed bentonite.
- (7) A **bucket well** shall be plugged as follows:
 - (A) A **bucket well installed as buried slab construction** shall be filled with gravel from the bottom of the well to within ten (10) feet below the ground surface. Neat cement, bentonite slurry, or medium grade or coarse grade crushed or pelletized bentonite shall be installed in the casing or well pipe from no less than ten (10) feet below the ground surface to within two (2) feet below the ground surface. The well pipe shall be severed at least two (2) feet below the ground surface and covered with a cement plug larger in diameter than the well pipe. The remaining hole shall be filled with natural clay material to the ground surface.
 - (B) **Bucket well construction using casing** with an inside diameter of less than twelve (12) inches extending the entire length of the borehole and equipped with a well screen shall be abandoned under subdivision (4)(A).

(C) An **uncased borehole drilled by a bucket rig** shall be filled with natural clay material from the bottom of the hole to the ground surface. The clay material shall be thoroughly tamped to minimize settling.

(D) For **other than buried slab construction**, a bucket well shall be filled with gravel from the bottom of the well to at least five (5) feet below ground surface. The top section of the concrete or tile well casing shall be removed to cause the top of the well to terminate below *the* ground surface. The well shall be filled with at least one (1) foot of neat cement, bentonite slurry, or pelletized, medium grade, or coarse grade crushed bentonite from at least five (5) feet below ground surface to the top of the well casing. The well casing shall be covered with a cement plug larger in diameter than the borehole. The remaining hole shall be filled with natural clay material to ground surface.

(8) If a **dewatering well** casing is removed following use, the remaining borehole shall initially be filled with granular, pelletized, medium grade, or coarse grade crushed bentonite a minimum of one (1) foot thick. The remainder of the borehole shall be filled to the ground surface with natural earth materials obtained during the drilling process and *shall* be thoroughly tamped to minimize settling.

(9) If a **dewatering well** casing is removed following use and the **well site will be excavated** as part of the construction project, the remaining borehole shall be filled to the ground surface with natural earth materials obtained during the drilling process and *shall* be thoroughly tamped to minimize settling.

Notice of abandonment and plugging

(f) The **division shall be notified in writing** of a well abandonment within thirty (30) days after plugging is completed.

Rule 11. Inspections

312 IAC 13-11-1 Inspections; compliance

Sec. 1. A conservation officer or another representative of the department may observe the installation of a water well or pump and may inspect equipment used to drill a well. Work that does not comply with this article or IC 25-39 must be promptly corrected by the water well driller. Work that is covered contrary to the request of a department representative must, upon request, be uncovered for inspection and replaced by the water well driller.

312 IAC 13-11-2 Inspections by the department of records of a water well driller

Sec. 2. A conservation officer or another representative of the department may, at any reasonable time, inspect any record maintained by a water well driller that is needed to comply with IC 25-39 or this article.

APPENDIX H

WELLHEAD PROTECTION PROVISIONS



Fact Sheet

100 N. Senate Ave., Indianapolis, IN 46206-6015
(800) 451-6027
<http://www.state.in.us/idem>

SUMMARY OF WELLHEAD PROTECTION PROVISIONS INCLUDED IN INDIANA STATUTE, RULE AND NON-RULE POLICY

Notification

IC 13-18-17-6 The Indiana Wellhead Protection Rule, or any zoning under IC 36-7 to establish protection zones around community water system wells, may not restrict any activity by an owner of land, a mineral owner, or a mineral leaseholder of record unless the owner or leaseholder is sent written notice of, and has an opportunity to be heard on, the establishment of the zone and the construction of the community water supply system that caused the establishment of the zone.

Solid Waste Landfills

329 IAC 10-16-11(b)

For solid waste landfills:

- new and lateral expansions must not be located in the 5 year time of travel; or
- within 3,000 feet of a community water supply well, if no 5 year time of travel established.

Spill Reporting

327 IAC 2-6.1-5(2)

The following spills from a facility that has been notified in writing by a water utility that it is located in a delineated public water supply wellhead protection area as approved by the department under 327 IAC 8-4.1 [shall be reported]:

- hazardous substance or extremely hazardous substances in excess of 100 pounds or the reportable quantity, whichever is less;
- spills of petroleum in excess of 55 gallons;
- spills of objectionable substances.

Secondary Containment of Hazardous Materials

327 IAC 2-10-3(a)(11) - final adoption May 1998

New facilities must provide secondary containment unless there is:

- less than 660 gallons at a facility that is not in a delineated wellhead protection area as approved by the department under 327 IAC 8-4.1; or
- less than 275 gallons at a facility that has been notified in writing by a water utility that it is in a delineated wellhead protection area as approved by the department under 327 IAC 8-4.1.

Underground Storage Tanks

327 IAC 9-2-1.1 - final adoption September 1998

New UST systems within a 1 year time of travel to a community public water supply well must be constructed with:

- a double walled tank;
- double walled piping; and
- a secondary barrier system.

Risk-Integrated System of Closures

Draft Non-Rule Policy

Ground water remediation in wellhead protection areas should:

- cleanup contaminated ground water to drinking water standards;
- apply treatment to contaminated ground water at the well to ensure delivered water meets drinking water standards; or
- implement exposure prevention with concurrence of public water supply and IDEM.

APPENDIX I

IDEM APPROVAL LETTERS



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We make Indiana a cleaner, healthier place to live.

Mitchell E. Daniels, Jr.
Governor

Thomas W. Easterly
Commissioner

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
(800) 451-6027
www.IN.gov/idem

February 5, 2008

Mr. Mel Davis
Municipal Utilities Director
City of Lawrenceburg
230 Walnut St.
Lawrenceburg, Indiana 47025

Re: WHPA delineation review
PWSID 5215006

Dear Mr. Davis:

City of Lawrenceburg submitted an updated wellhead protection area (WHPA) delineation report for review by IDEM for the new Lawrenceburg Wellfield. Based upon the information provided, the model used is considered sufficiently conservative, and IDEM approves your WHPA **delineation** for the new Lawrenceburg Wellfield, an important piece of your wellhead protection management plan.

If you have questions regarding the review of your WHPA delineation, please contact Rebecca Travis at 317/308-3329.

Sincerely,

James Sullivan, Chief
Ground Water Section
Drinking Water Branch
Office of Water Quality

JS/ret

cc: Connie Cousins-Leatherman, Ground Water Section
James Carr, Hydrophase, 4314 Fairhope Dr., Indianapolis, IN 46237



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We Protect Hoosiers and Our Environment.

Mitchell E. Daniels Jr.
Governor

Thomas W. Easterly
Commissioner

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
www.idem.IN.gov

April 17, 2008

Mr. Charles M. (Mel) Davis, Municipal Utilities Director
Lawrenceburg Municipal Utilities
230 Walnut Street
Lawrenceburg, Indiana 47025

Dear Mr. Davis:

Re: PWSID 5215006
Phase I Wellhead Protection Plan
Notice of Decision

This letter is to inform you that the Office of Water Quality has formally reviewed and approved the City of Lawrenceburg's Phase I Wellhead Protection Plan submission. We found the plan complete, satisfying the requirements outlined in Indiana's Wellhead Protection Rule, 327 IAC 8-4.1, for a Phase I Wellhead Protection Plan.

We commend you and the local planning team for your efforts in developing a comprehensive plan to protect your community's public drinking water supply. Per 327 IAC 8-4.1-11(c) and 327 IAC 8-4.1-10(a)(2)(C), the management plan and potential sources of contamination must be updated every seven (7) years. The City of Lawrenceburg's next update will be due April 17, 2015.

If you have any questions regarding the continued implementation of your community's wellhead protection plan, please call me at (317)308-3388, or Adam Watts of my staff at (317)308-3293 or toll free at (800) 451-6027 extension(s) 308-3388 or 308-3293 (in Indiana). You may also reach us by e-mail. My e-mail address is jsulliva@dem.state.in.us and Adam Watts's e-mail address is awatts@idem.IN.gov.

Sincerely,

James Sullivan, Chief
Ground Water Section
Drinking Water Branch
Office of Water Quality

JS/aw
Enclosure
cc: James E. Carr, LPG, Hydrophase, Inc.