

October 10, 2018

Paul M. Collins
Attorney and Counselor at Law
Miller Canfield
One Michigan Avenue, Suite 900
Lansing, Michigan 48933

**Re: Lansing Board of Water & Light
Erickson Station
Compliance with 40 CFR §257 – Location Restrictions**

Dear Mr. Collins:

Mayotte Design & Engineering, PC (MD&E) was commissioned by the Lansing Board of Water & Light (LBWL) to evaluate as-built engineering specifications for the existing impoundment system at the Erickson Station Power Plant (Erickson Station, subject property, or site) with respect to 40 Code of Federal Regulations (CFR) §257 – Location Restrictions for Coal Combustion Residual (CCR) Surface Impoundments. Specifically, this letter report focuses on an evaluation of the restrictions associated with 40 CFR §257.60, §257.62, §257.63 and §257.64.

Background

Description of Relevant Structures

Erickson Station is an electrical power generation facility located at 3725 South Canal Road in Delta Township, Ingham County, Michigan (Figure 1). The latitude and longitude of power plant on the subject property are 42° 41' 32.83" N and 84° 39' 27.89" W, respectively. On-premises elevations range from 870 feet (ft) to 883 ft above geodetic datum (agd).

Erickson Station generates up to 165 megawatts of electric power from one coal-fired boiler, designated as Unit 1. Currently, bottom-ash slurries from Unit 1 are processed on-site in dewatering tanks (hydrobins) and a sequence of two flow-through surface impoundments (i.e., Forebay and Retention Basin, respectively). Effluent from the Retention Basin flows to a third impoundment, the Clear Water Pond (CWP). Water that accumulates in the CWP is returned to the Erickson plant and re-used as: seal trough water; ash quench water; and for jet pump operation for ash removal.

The Forebay and Retention Basin were constructed in 2014 to replace a 33-acre impoundment that had been in operation from 1970 until 2009. The 33-acre impoundment was formally decommissioned during 2009 to 2014. Both the Forebay and Retention Basin were constructed using best available technology. The CWP was constructed in 1970 and previously received overflow from the 33-acre ash impoundment. The CWP is lined with compacted clay.

The cores of the embankments for the Forebay, Retention Basin and CWP are constructed with clay-rich engineered fill with hydraulic permeabilities less than 10^{-7} cm/sec. The flanks of the embankments also consist of clay-rich engineered fill. The base grade elevation of both the Forebay and Retention Basin is 871.5 ft agd. The base grades of the CWP range from 871 to 874 ft agd.

The interior embankments and floors of both the Forebay and Retention Basin are lined with a layer of geosynthetic clay (GCL) overlain with a 40-millimeter-thick flexible polyvinylchloride membrane (FML). Each FML is protected with geofabric and a 6- to 12-inch layer of sand. The tops of the embankments that are subject to wave action are protected with an additional layer of geofabric and 6 to 12 inches of stone rip-rap. Vents are positioned at 40 feet intervals (approximately) around the perimeters of the Forebay and Retention Basin to relieve gas pressures that may accumulate beneath the liner materials.

The floor of the CWP consist of compacted clay. The tops of the interior embankments of the CWP are protected with approximately 6 inches of stone rip-rap.

Geology and Hydrogeology

Erickson Station resides within the Lansing Loamy Plains physiographic region of Michigan. According to the Michigan Geologic Survey, this region is characterized by a heterogeneous mix of glacial hilly and rolling landscapes associated with the Saginaw, Lake Michigan and Huron-Erie lobes of the Laurentide ice sheet. Unconsolidated deposits in the area surrounding the subject property consist of medium to coarse textured tills and ground moraine deposits associated with the Saginaw Lobe. Topographic relief in the area is moderate. Soils are predominantly loams.

Boring logs for 41 water wells located within a 1-mile radius of the impoundments at the Erickson Station (Figure 2 and Attachment A) were examined to further evaluate the geology and hydrogeology in the vicinity of the site. In general, these records indicate that the area is underlain

by a 30 to 120 feet thick sequence of layered unconsolidated glacial till and alluvium over shales and sandstone bedrock associated with the Saginaw Formation. The unconsolidated deposits consist predominantly of interlayered and poorly sorted clays, sand and gravels. Water wells in the area are screened within the Saginaw Formation. Water levels measured in these wells range from 10 to 60 ft below grade.

Location Restrictions

The location restrictions in the CCR Rule that were examined as part of the subject study include:

- §257.60 – Placement Above the Uppermost Aquifer
- §257.62 – Fault Areas
- §257.63 – Seismic Impact Zones
- §257.64 – Unstable Areas

§257.60 – Uppermost Aquifer

The CCR Rule requires new CCR landfills, existing and new CCR surface impoundments, and lateral expansions of CCR units to be constructed with a base that is 5 feet above the upper limit of the uppermost aquifer (40 CFR §257.60, 2015). The CCR Rule defines the uppermost aquifer as the geologic formation nearest the natural ground surface that is an aquifer capable of yielding usable quantities of groundwater to wells or springs (40 CFR §257.53, 2015).

The till deposits beneath Erickson Station are not productive sources of groundwater. Sandstone layers within the Saginaw Formation are more productive and common targets for water well screen placement in the vicinity of the site (Attachment A). The potentiometric surfaces associated with these aquifers range from 10 feet below grade near the Grand River, southeast of Erickson Station, to over 60 feet north of the site, near Millett Highway (Figure 1).

Test pits excavated, and borings drilled, at Erickson Station (Figure 3, Attachment B) reveal that on-site soils are clay-rich and unsaturated to depths of at least 5 feet beneath the base grades of the impoundment system. Sands and sandy clays are differentially saturated at depths ranging from approximately 5 to 15 feet below base grades. Within these strata, moisture is layered, including thin zones of saturation interbedded between moist and dry sediments. The differential nature of moisture content within these materials is not characteristic of geologic materials that produce usable quantities of groundwater.

In-field permeability testing was performed at four test pit and boring locations within the footprint of the impoundment system in 1969 (Figure 3). The base elevation of the deepest of these pits was 867.5 ft agd (AP-5, Attachment B), positioned directly east of the CWP. A falling-head permeability test performed in soil boring AP-5 proved that saturated conditions did not exist within 5 feet of ground surface at that location.

Based on the analysis presented above, it is concluded that the base elevations of the Erickson Station impoundment system are significantly greater than 5 feet above the uppermost aquifer beneath the site. The Saginaw Formation is considered to be the uppermost aquifer beneath the subject property. The top of the Saginaw Formation beneath the impoundment system was identified in AP-5 (Attachment B) at a depth of approximately 67 ft below grade.

§257.62 – Fault Areas

The CCR Rule limits the location of new CCR landfills, existing and new CCR surface impoundments, and lateral expansions of CCR units to areas outside fault damage zones (40 CFR §257.62, 2015). The CCR Rule requires these CCR units to be located at least 200 feet from the outermost damage zone of faults that have experienced displacement with the Holocene time period. The CCR Rule defines displacement as the relative movement of any two sides of a fault measured in any direction. The CCR Rule defines the Holocene time period as the most recent epoch of the Quaternary period, extending from the end of the Pleistocene Epoch, at 11,700 years before present, to present (40 CFR §257.53, 2015).

Consultation of the U.S. Quaternary Faults and Folds Database (US Geologic Hazards Science Center, Boulder, Colorado) reveals the presence of no faults in the Lansing, Michigan region, including area surrounding the subject property.

§257.63 – Seismic Impact Zones

The CCR Rule requires new CCR landfills, existing and new CCR surface impoundments, and lateral expansions of CCR units to be located outside seismic impact zones (40 CFR §257.63, 2015). A seismic impact zone is defined in the CCR Rule as an area having a 2% or greater probability that the maximum expected horizontal acceleration, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10g in 50 years (40 CFR §257.53, 2015).

Figure 4 identifies Seismic Hazard Zones within the continental United States, as determined by the U.S. Geologic Survey (USGS). As revealed on this figure, the Lansing, Michigan area, including the Erickson Station, is considered by the USGS to be within a Seismic Impact Zone in which there is a less 2% or greater probability that the maximum expected horizontal acceleration, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10g in 50 years.

Further, the Federal Emergency Management Association has categorized central Michigan to be in Seismic Design Category A (Figure 4). Seismic Design Category A is defined as an area in which there is a very small probability of experiencing damaging earth-quake effects.

§257.64 – Unstable Areas

The CCR Rule requires that existing and new CCR landfills, existing and new CCR surface impoundments, and lateral expansions of CCR units not be located in unstable areas (40 CFR §257.64, 2015). The CCR Rule defines an unstable area as a location that is susceptible to natural or human induced events or forces capable of impairing the integrity, including structural components of some or all of the CCR unit that are responsible for preventing releases from such unit. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and karst terrains (40 CFR §257.53, 2015). The CCR Rule lists minimum factors that must be considered when evaluating whether an area is unstable. These factors include:

- On-site or local soil conditions that may result in significant differential settling;
- On-site or local geologic or geomorphological features; and/or
- On-site or local human-made features or events, both surface and subsurface.

The Erickson Station impoundments have been built on relatively flat ground that is not subject to mass wasting. The poorly-sorted nature of the layered till and alluvium deposits beneath the site is favorable for stable geotechnical conditions with limited potential for differential settling.

Bedrock beneath the subject property consists predominantly of shale and sandstone, materials not susceptible to mineral dissolution and widespread development of karst features.

There are no man-made surface or subsurface features in the proximity of the Erickson Station that are likely to promote instability of the impoundment structures.

Note that the southern embankment of the CWP is adjacent to a railroad right-of-way (ROW, Figure 1). Since construction was completed in 1970, there have been no structural impacts to the embankment from vibrations or runoff from the ROW.

Certification

As a Professional Engineer in the State of Michigan, I certify that this report was prepared in accordance with the requirements of 40 Code of Federal Regulations §257. The data and information presented in this letter report was assembled under my direct control. I further certify that a satisfactory demonstration of compliance with the requirements of 40CFR Sections §257.60, §257.62, §257.63 and §257.64 has been made for the impoundment system at Erickson Station.

This report is intended for the sole purpose of verifying the location restrictions associated with CCR Rule §257 and not intended to be reused by LBWL or others without my specific verification or authorization.

Sincerely,

Mayotte Design & Engineering, PC

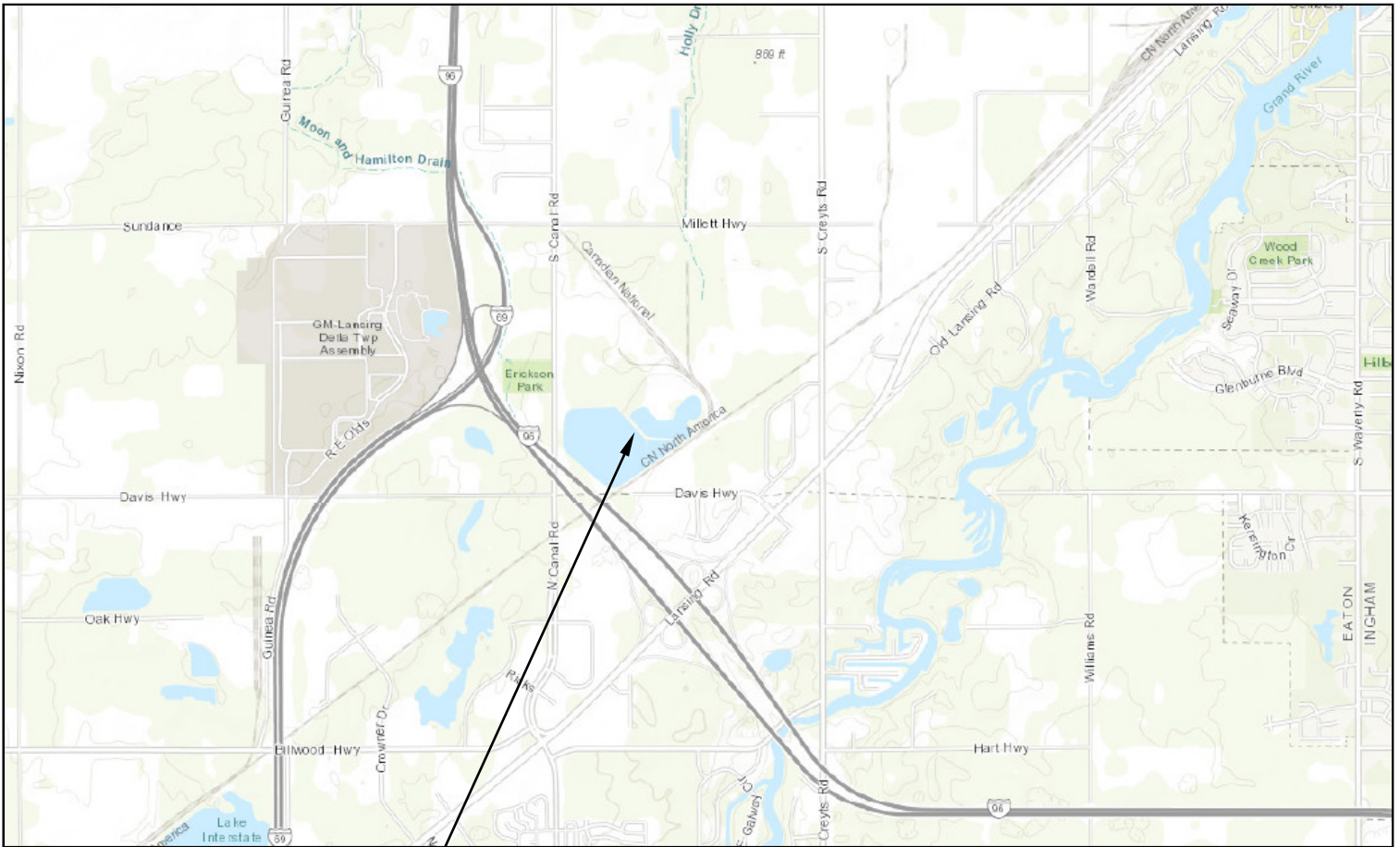


Timothy J. Mayotte, Ph.D., CPG, P.E.
Owner/President
Michigan Licensed Professional Engineer
No. 41981

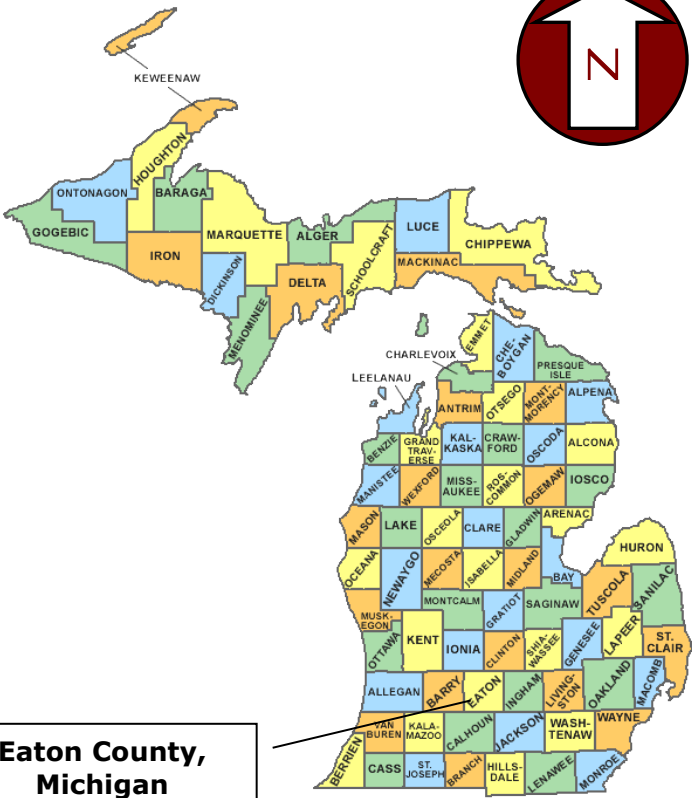
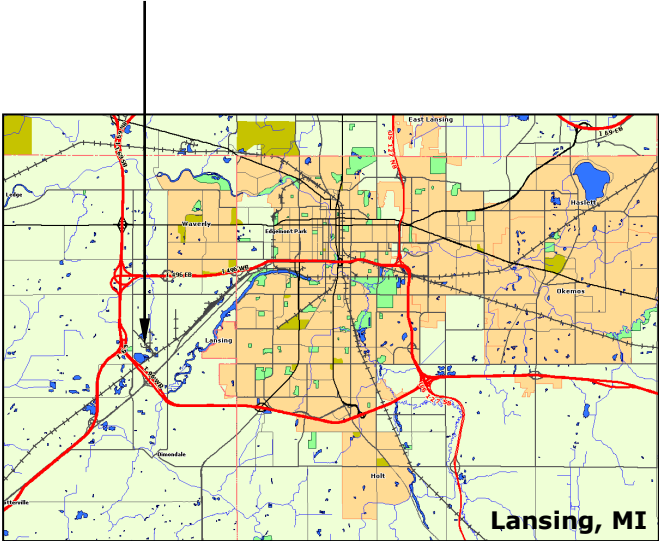
Attachments

cc: Cheryl Loudon - LBWL

FIGURES



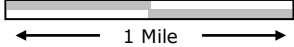
LBWL Erickson Station
 3725 Canal Road
 Delta Township, Michigan



**Eaton County,
 Michigan**

Copyright 2005 digital-topo-maps.com

FIGURE 1 - SITE LOCATION





NOTES:

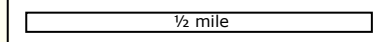
- Map well identifications (in red text) correspond to last 4 to 5 digits of well identification numbers on Welllogic® logs.

Background imagery from MDEQ

Site Name/Address:

LBWL Erickson Station
 3725 South Canal Road
 Delta Township, Michigan

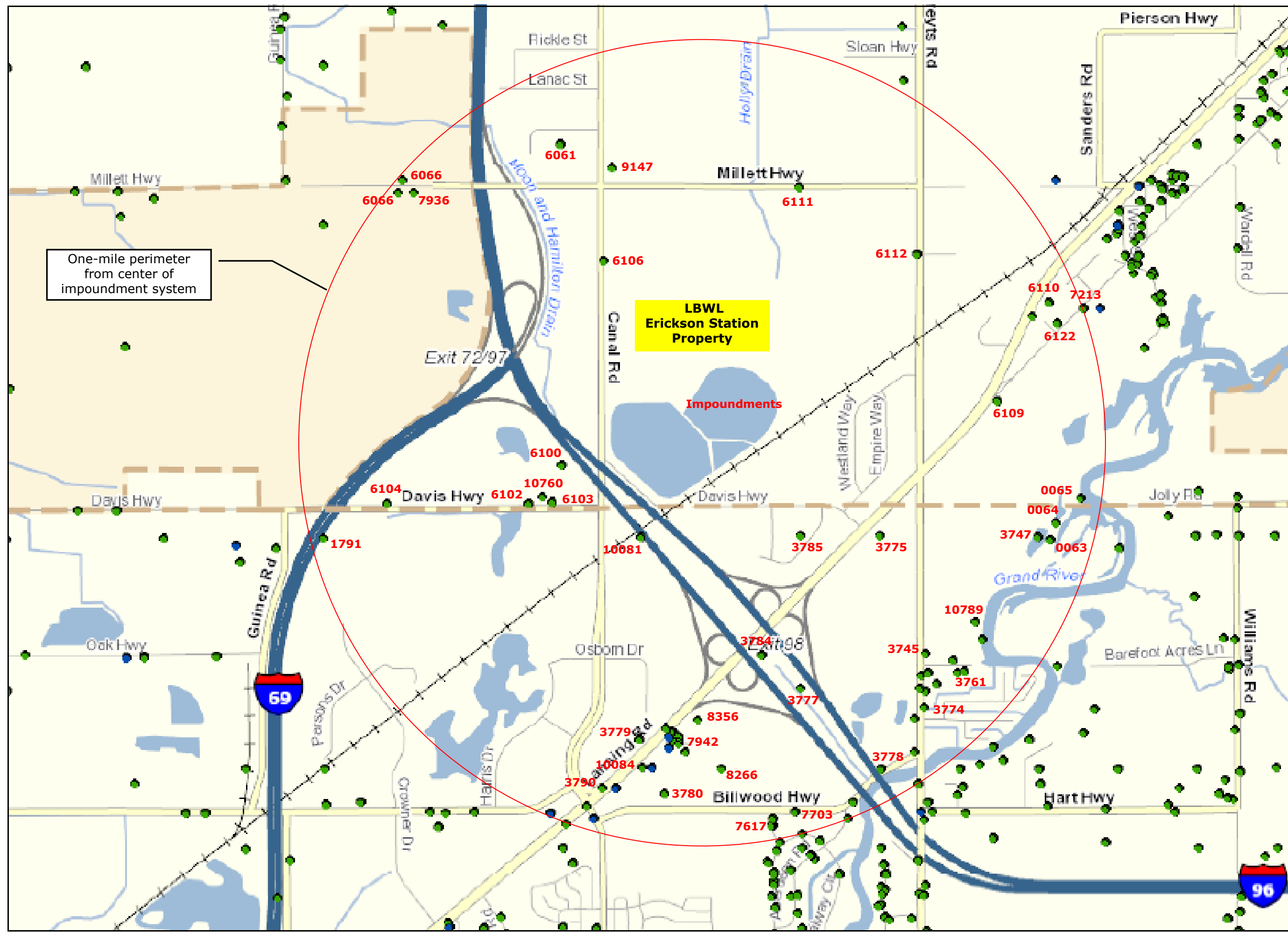
Scale:



Date:
 10/9/2018

Drawn By:
 TJM

FIGURE 2
Water Well Locations





NOTES:

- **Soil Borings:**
 - AP-3 (1969)
 - AP-4 (1969)
 - AP-5 (1969)
 - AP-6 (1969)
 - AP-7 (1969)
 - CW-SB-01 (2018)
 - CW-SB-02 (2018)
 - CW-SB-03 (2018)

- **Test Pits:**
 - AP-1 (1969)
 - AP-2 (1969)
 - EW-F-1 (2014)
 - EW-F-2 (2014)
 - EW-F-3 (2014)
 - EW-F-4 (2014)
 - EW-F-5 (2014)
 - EW-F-6 (2014)

Background imagery from Google Earth.

Site Name/Address:

LBWL Erickson Station
3725 South Canal Road
Delta Township, Michigan

Scale:

1/2 mile

Date:
10/9/2018

Drawn By:
TJM

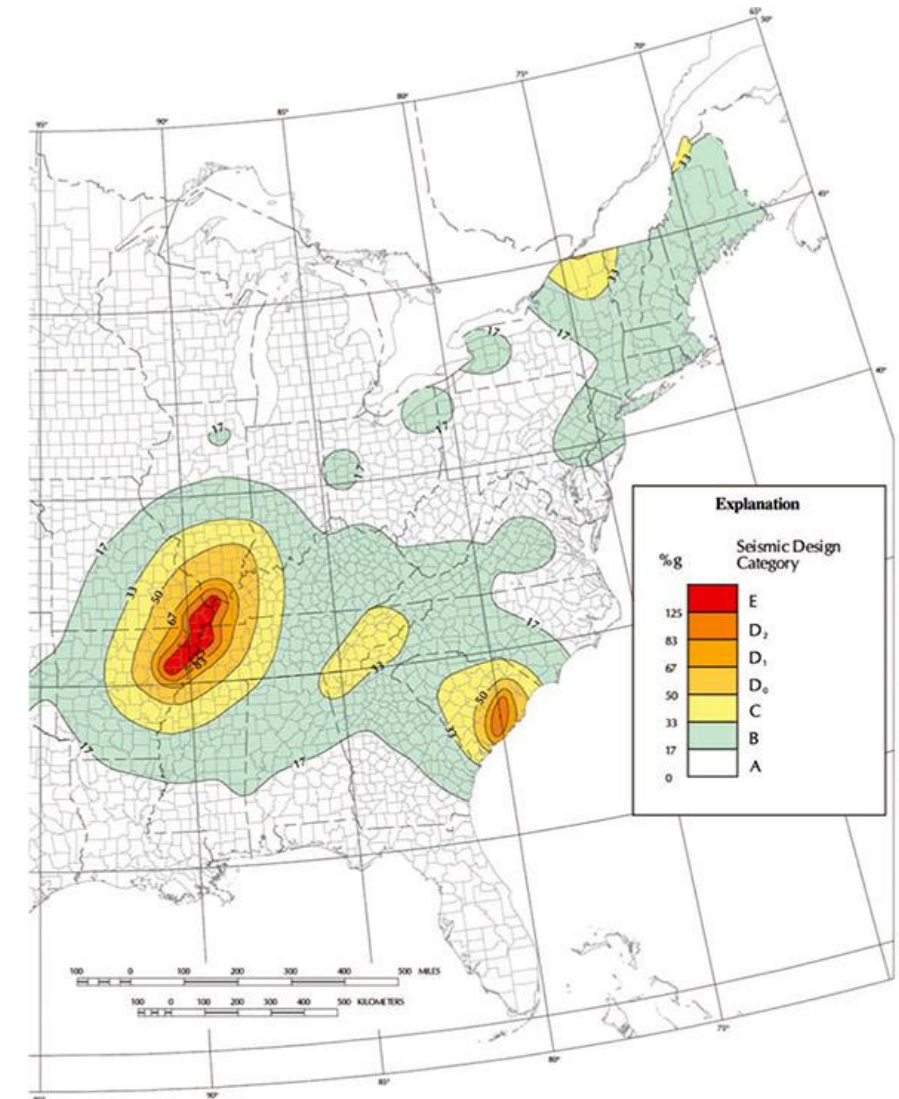
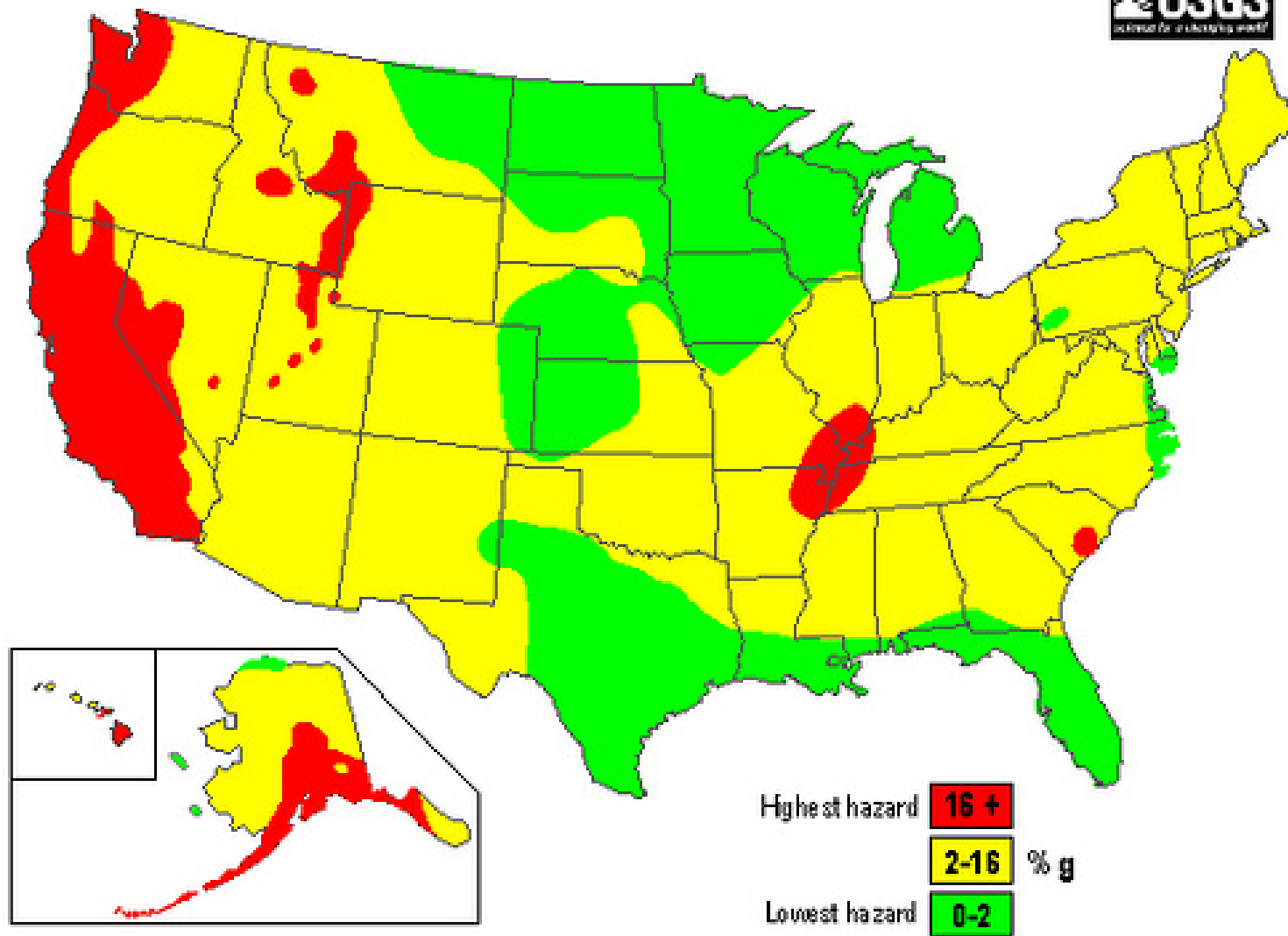
FIGURE 3
Site Layout





National Seismic Hazard Map

Adapted from http://earthquake.usgs.gov/research/hazmaps/products_data/48_States/index.php



<https://www.fema.gov/earthquake-hazard-maps>

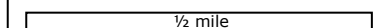
NOTES:

- USGS Seismic Hazard Map (left).
- FEMA Seismic Design Map (right).

Site Name/Address:

LBWL Erickson Station
 3725 South Canal Road
 Delta Township, Michigan

Scale:



Date:
 10/9/2018

Drawn By:
 TJM

FIGURE 4
Seismic Hazard Maps

ATTACHMENT A
Local Water Well Logs



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No:	County: Eaton			Township: Windsor	
Well ID: 23000000063		Town/Range: 03N 03W	Section: 2	Well Status: Active	WSSN: 3760	Source ID/Well No: BWL WELL 85-01
		Distance and Direction from Road Intersection: WSSN #03760; 2400' W. OF WILLIAMS RD., 675' S OF JOLLY				
		Well Owner: BOARD OF WATER & LIGHT				
Elevation: 836 ft.		Well Address: BWL WELL 85-01 LANSING, MI		Owner Address: 123 W. OTTAWA ST. LANSING, MI 48933		
Latitude: 42.681387						
Longitude: -84.63426						
Method of Collection: Interpolation-Map						

Drilling Method: Rotary	Well Use: Type I public	Pump Installed: No
Well Depth: 93.00 ft.	Date Completed: 11/21/1963	Pressure Tank Installed: No
Well Type: Replacement	Height: 0.00 ft. below grade	Pressure Relief Valve Installed: No
Casing Type: Unknown		
Casing Joint: Unknown		
Casing Fitting: None		
Diameter: 36.00 in. to 35.00 ft. depth		
Borehole:		

Static Water Level: 999.99 ft. Below Grade	Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
Well Yield Test:		Brown Sand & Gravel Silty	15.00	15.00
		Gray Sand Fine	41.00	56.00
		Clay	1.00	57.00
		Sand & Gravel	18.00	75.00
		Black Hardpan W/Boulders	9.00	84.00
		Gravel Coarse	6.00	90.00
		Hardpan W/Boulders	3.00	93.00

Screen Installed: Yes	Filter Packed: No
Screen Diameter: 18.00 in.	Blank: 0.00 ft. Above
Screen Material Type: Unknown	
Slot Length Set Between	
0.00 0.00 ft. 0.00 ft. and 90.00 ft.	
Fittings: None	

Well Grouted: Yes	Grouting Method: Unknown
Grouting Material	Bags Additives Depth
Unknown 0.00 None	0.00 ft. to 55.00 ft.

Wellhead Completion: Unknown	Drilling Machine Operator Name: RUSSEL HOFACRE
	Employment: Unknown
	Contractor Type: Unknown Reg No:
	Business Name:
	Business Address:

Nearest Source of Possible Contamination:	
Type Distance Direction	
None	

Abandoned Well Plugged: No	Water Well Contractor's Certification
Reason Not Plugged: Unknown	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.
	Signature of Registered Contractor
	Date

General Remarks: ORIGINAL WELLID# WAS 02001; CONTRACTOR DUNBAR DRILLING
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No:	County: Eaton			Township: Windsor	
<h2>Well ID: 23000000064</h2> <p>Elevation: 837 ft. Latitude: 42.682167 Longitude: -84.633913 Method of Collection: Interpolation-Map</p>		Town/Range: 03N 03W	Section: 2	Well Status: Active	WSSN: 3760	Source ID/Well No: BWL WELL 85-02
		Distance and Direction from Road Intersection: WSSN #03760; 2325' W OF WILLIAMS RD., 350' S OF JOLLY R				
		Well Owner: BOARD OF WATER & LIGHT				
Well Address: BWL WELL 85-02 LANSING, MI				Owner Address: 123 W. OTTAWA ST. LANSING, MI 48933		

Drilling Method: Rotary	Well Use: Type I public	Pump Installed: No
Well Depth: 85.00 ft.	Date Completed: 1/17/1964	Pressure Tank Installed: No
Well Type: Replacement	Height: 0.00 ft. below grade	Pressure Relief Valve Installed: No
Casing Type: Unknown		
Casing Joint: Unknown		
Casing Fitting: None		
Diameter: 18.00 in. to 36.00 ft. depth		
Borehole: 36.00 in. to 0.00 ft. depth		

Static Water Level: 999.99 ft. Below Grade	Well Yield Test:	Yield Test Method: Unknown	Formation Description		Thickness	Depth to Bottom
			Brown Clay		4.00	4.00
			Brown Sand & Gravel		10.00	14.00
			Gray Sand & Gravel		6.00	20.00

Screen Installed: Yes	Filter Packed: No	
Screen Diameter: 18.00 in.	Blank: 0.00 ft. Above	
Screen Material Type: Unknown		
Slot	Length	Set Between
0.00	36.00 ft.	45.00 ft. and 81.00 ft.
Fittings: None		

Well Grouted: Yes	Grouting Method: Unknown	
Grouting Material	Bags	Additives
Unknown	0.00	None
		Depth
		0.00 ft. to 45.00 ft.

Wellhead Completion: Unknown	Geology Remarks:

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: RUSSEL HOFACRE
Type	Employment: Unknown
None	
Distance	Direction

Abandoned Well Plugged: No	Contractor Type: Unknown	Reg No:
Reason Not Plugged: Unknown	Business Name:	
	Business Address:	

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks: ORIGINAL WELLID# WAS 02002; CONTRACTOR DUNBAR DRILLING

Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No:	County: Eaton			Township: Delta	
Well ID: 23000000065		Town/Range: 04N 03W	Section: 2	Well Status: Active	WSSN: 3760	Source ID/Well No: BWL WELL 85-03
		Distance and Direction from Road Intersection: WSSN #03760; 2025' W OF WILLIAMS RD., 150' S OF JOLLY R				
Elevation: 836 ft.		Well Owner: BOARD OF WATER & LIGHT				
Latitude: 42.683279		Well Address: BWL WELL 85-03 LANSING, MI			Owner Address: 123 W. OTTAWA ST. LANSING, MI 48933	
Longitude: -84.632416						
Method of Collection: Interpolation-Map						

Drilling Method: Rotary	Well Use: Type I public	Pump Installed: No
Well Depth: 105.00 ft.	Date Completed: 5/15/1964	Pressure Tank Installed: No
Well Type: Replacement	Height: 0.00 ft. below grade	Pressure Relief Valve Installed: No
Casing Type: Steel - black		
Casing Joint: Unknown		
Casing Fitting: None		
Diameter: 18.00 in. to 72.10 ft. depth		
Borehole:		

Static Water Level: 999.99 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test:			
Yield Test Method: Unknown	Sand & Gravel W/Silt	14.00	14.00
	Sand & Gravel	27.00	41.00
	Gravel Coarse	17.00	58.00
	Clay & Stones Hard Dry	22.00	80.00
	Clay Sandy	3.00	83.00
	Sand Fine	2.00	85.00
	Hardpan Coarse	12.00	97.00
	Gravel & Boulders Coarse	8.00	105.00

Screen Installed: Yes	Filter Packed: No
Screen Diameter: 18.00 in.	Blank: 0.00 ft. Above
Screen Material Type: Unknown	
Slot Length Set Between	
0.00 36.00 ft. 67.00 ft. and 103.00 ft.	
Fittings: None	

Well Grouted: Yes	Grouting Method: Unknown
Grouting Material	Bags Additives Depth
Unknown	0.00 None 0.00 ft. to 67.00 ft.

Wellhead Completion: Unknown	Geology Remarks:

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: RUSSELL HOFACRE
Type Distance Direction	Employment: Unknown
None	Contractor Type: Unknown Reg No:

Abandoned Well Plugged: No	Business Name:
Reason Not Plugged: Unknown	Business Address:
Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks: ORIGINAL WELLID# WAS 02003; CONTRACTOR DUNBAR DRILLING;36.6' OF 18
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030302004

Tax No: 080002100055	Permit No:	County: Eaton	Township: Windsor			
Well ID: 23000003745		Town/Range: 03N 03W	Section: 2	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection: Aquifer: ROCK Well #: 230500204				
Elevation: 858 ft.		Well Owner:				
Latitude: 42.6761989739		Well Address: 7566 CREYTS RD MI			Owner Address:	
Longitude: -84.6419790535						
Method of Collection: Interpolation-Map						

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 235.00 ft.	Date Completed: 10/22/1980	Pump Installation Date:	HP:
Well Type: Unknown	Height:	Manufacturer: Unknown	Pump Type: Unknown
Casing Type: Unknown		Model Number:	Pump Capacity: 12 GPM
Casing Joint: Unknown		Drop Pipe Length: 0.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 158.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 49.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 59.00 ft. after 1.00 hrs. at 28 GPM			
Yield Test Method: Unknown	Sand & Clay	10.00	10.00
	Sand & Clay	13.00	23.00
	Clay	42.00	65.00
	Gravel	4.00	69.00
	Gravel & Clay	39.00	108.00
	Gravel & Clay	26.00	134.00
	Shale	15.00	149.00
	Sandstone W/Shale	6.00	155.00
	Shale	9.00	164.00
	Sandstone W/Shale	52.00	216.00
	Sandstone	19.00	235.00

Screen Installed: Yes	Filter Packed: No	Geology Remarks: (Continued On Page 2)	
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	SAND/CLAY. [10] [28] [10] SAND/CLAY. [13] [28] [23] CLAY. [42] [10] [65]	
Screen Material Type:		GRAVEL. [4] [30] [69] GRAVEL/CLAY. [39] [31] [108] GRAVEL/CLAY. [26] [31]	
Slot Length Set Between		[134] SHALE. [15] [55] [149] SANDSTONE/SHALE. [6] [52] [155] SHALE. [9]	
0.00 0.00 ft. 0.00 ft. and 0.00 ft.		[55] [164] SANDSTONE/SHALE. [52] [52] [216] SANDSTONE. [19] [
Fittings: None			
Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material	Bags	Additives	Depth
Other	0.00	None	0.00 ft. to 0.00 ft.
Wellhead Completion: Pitless adapter			

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: Syd Dulaney	02/05/90
Type	Employment: Unknown	
Septic tank	75 ft.	Southwest

(Continued on page 2)

Abandoned Well Plugged: No
Reason Not Plugged:

General Remarks:
Other Remarks: Grouting Material 1:Well grouted material unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030302006

Tax No: 080002300237	Permit No:	County: Eaton	Township: Windsor			
Well ID: 23000003747		Town/Range: 03N 03W	Section: 2	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection: Aquifer: saginaw sandstone Well #: 230500206				
Elevation: 885 ft.		Well Owner:				
Latitude: 42.681555		Well Address: 10275 HART HWY MI			Owner Address:	
Longitude: -84.63503						
Method of Collection: QQQ - Centroid						

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 200.00 ft.	Date Completed: 1/12/1983	Pump Installation Date:	HP:
Well Type: Unknown	Height:	Manufacturer: Unknown	Pump Type: Unknown
Casing Type: Unknown		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Unknown		Drop Pipe Length: 0.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 110.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 40.00 ft. Below Grade	Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
Well Yield Test:		Sand & Clay	31.00	31.00
		Sand & Gravel	31.00	62.00
		Gravel & Clay	40.00	102.00
		Sandstone	53.00	155.00
		Sandstone W/Shale	45.00	200.00

Screen Installed: Yes	Filter Packed: No	Geology Remarks:		
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	SAND/CLAY. [31] [28] [31] SAND & GRAVEL. [31] [25] [62] GRAVEL/CLAY. [40] [31] [102] SANDSTONE. [53] [50] [155] SANDSTONE/SHALE. [45] [52] [200]		
Screen Material Type:				
Slot	Length	Set Between		
0.00	0.00 ft.	0.00 ft. and 0.00 ft.		
Fittings: None				
Well Grouted: Yes	Grouting Method: Unknown			
Grouting Material	Bags	Additives	Depth	
Other	0.00	None	0.00 ft. to 0.00 ft.	
Wellhead Completion: Pitless adapter				

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: Syd Dulaney	02/05/90
Type	Employment: Unknown	
Septic tank		
Distance	Contractor Type: Unknown	Reg No: 34-0383
100 ft.		
Direction	Business Name:	
South		

Abandoned Well Plugged: No	Business Address:
Reason Not Plugged:	
	Water Well Contractor's Certification
	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.
	Signature of Registered Contractor
	Date

General Remarks:
Other Remarks: Grouting Material 1:Well grouted material unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030302020

Tax No:	Permit No:	County: Eaton	Township: Windsor			
Well ID: 23000003761 Elevation: 842 ft. Latitude: 42.6753317178 Longitude: -84.6400001749 Method of Collection: Loran C		Town/Range: 03N 03W	Section: 2	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection: 7454 CAROL LANE				
		Well Owner: LARRY LAW				
		Well Address: DIMONDALE, MI 48821		Owner Address: DIMONDALE, MI 48821		

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 180.00 ft.	Date Completed: 2/2/1982	Pump Installation Date:	HP: 0.50
Well Type: Unknown	Height: 0.00 ft. below grade	Manufacturer: Other	Pump Type: Submersible
Casing Type: PVC plastic	Casing Joint: Unknown	Model Number:	Pump Capacity: 10 GPM
Casing Fitting: Drive shoe	Diameter: 5.00 in. to 83.00 ft. depth	Drop Pipe Length: 35.00 ft.	Pump Voltage:
Borehole:		Drop Pipe Diameter:	Drilling Record ID:
		Draw Down Seal Used: No	
		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 10.00 ft. Below Grade	Well Yield Test: Pumping level 180.00 ft. after 1.00 hrs. at 30 GPM	Yield Test Method: Unknown
Screen Installed: Yes	Filter Packed: No	
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	
Screen Material Type:	Slot Length Set Between: 0.00 0.00 ft. 0.00 ft. and 0.00 ft.	
Fittings: None		
Well Grouted: Yes	Grouting Method: Unknown	
Grouting Material: Bentonite slurry	Bags: 0.00	Additives: None
	Depth: 0.00 ft. to 0.00 ft.	

Formation Description	Thickness	Depth to Bottom
Sand	15.00	15.00
Clay	15.00	30.00
Gravel	40.00	70.00
Sandstone	13.00	83.00
Shale W/Sandstone	97.00	180.00

Geology Remarks:
SAND. [15] [20] [15] CLAY. [15] [10] [30] GRAVEL. [40] [30] [70] SANDSTONE. [13] [50] [83] SHALE, STREAKS SANDSTONE. [97] [56] [180]

Wellhead Completion: Pitless adapter	Drilling Machine Operator Name: LJT WELL DRILLING
Nearest Source of Possible Contamination:	Employment: Unknown
Type: Unknown	Distance: 0 ft.
Direction: Unknown	Contractor Type: Unknown
Abandoned Well Plugged: No	Reg No: 23-1077
Reason Not Plugged:	Business Name:
	Business Address:

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks: Pump Manufacturer:MCDONALD



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030302033

Tax No: 23080002300080	Permit No:	County: Eaton	Township: Windsor			
Well ID: 23000003774		Town/Range: 03N 03W	Section: 2	Well Status:	WSSN:	Source ID/Well No:
Elevation: 1899 ft.		Distance and Direction from Road Intersection: 3/8 MI N OF HART HWY ON THE EAST SIDE				
Latitude: 42.673765		Well Owner: FAY FRANKLIN				
Longitude: -84.642118		Well Address: 7378 CREYTS RD DIMONDALE, MI 48821		Owner Address: 7378 CREYTS RD DIMONDALE, MI 48821		
Method of Collection: Address Matching-House Number						

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 155.00 ft.	Date Completed: 8/19/1997	Pump Installation Date:	HP: 0.50
Well Type: Replacement	Height:	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 83.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 90.00 ft. depth		Draw Down Seal Used: No	
Borehole: 8.00 in. to 90.00 ft. depth		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 40.00 ft. Below Grade	Well Yield Test: Pumping level 155.00 ft. after 0.50 hrs. at 10 GPM	Yield Test Method: Unknown	Formation Description		Thickness	Depth to Bottom
			Sand	18.00	18.00	
			Gravel	43.00	61.00	
			Clay W/Shale	28.00	89.00	
			Shale	27.00	116.00	
			Sandstone	39.00	155.00	

Screen Installed: Yes	Filter Packed: No	Geology Remarks:	
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	SAND. [18] [20] [18] GRAVEL. [43] [30] [61] CLAY & SHALE. [28] [10] [89]	
Screen Material Type:		SHALE. [27] [55] [116] SANDROCK. [39] [54] [155]	
Slot Length Set Between			
0.00 0.00 ft. 0.00 ft. and 0.00 ft.			
Fittings: None			
Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material Bags Additives Depth			
Bentonite slurry 0.00 None 0.00 ft. to 90.00 ft.			

Wellhead Completion: Other	
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Nearest Source of Possible Contamination:	Drilling Machine Operator Name: JOE WEST
Type Distance Direction	Employment: Unknown
Septic tank 90 ft. Northeast	
	Contractor Type: Unknown Reg No: 19-1868

Abandoned Well Plugged: Yes	Business Name:
	Business Address:
	Water Well Contractor's Certification
	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.
Casing Removed:	Signature of Registered Contractor Date

General Remarks:
Other Remarks: Wellhead Completion:Approved Pit



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030303004

Tax No:	Permit No:	County: Eaton			Township: Windsor		
Well ID: 23000003775		Town/Range: 03N 03W	Section: 3	Well Status:	WSSN:	Source ID/Well No:	
		Distance and Direction from Road Intersection: Aquifer: ROCK Well #: 230500304					
		Well Owner:					
Elevation: 870 ft.		Well Address:			Owner Address:		
Latitude: 42.681562		0 5 S-M78,W SID-CREYTS RD					
Longitude: -84.644809		MI					
Method of Collection: QQQ - Centroid							

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 300.00 ft.	Date Completed: 1/8/1977	Pump Installation Date:	HP:
Well Type: Unknown	Height:	Manufacturer: Unknown	Pump Type: Unknown
Casing Type: Unknown		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Unknown		Drop Pipe Length: 0.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 72.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 10.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 50.00 ft. after 0.50 hrs. at 15 GPM			
Yield Test Method: Unknown	Clay	10.00	10.00
	Sand & Clay	25.00	35.00
	Sand & Gravel	37.00	72.00
	Shale	200.00	272.00
	Sandstone	28.00	300.00

Screen Installed: Yes	Filter Packed: No	Geology Remarks: CLAY. [10] [10] [10] SAND/CLAY. [25] [28] [35] SAND & GRAVEL. [37] [25] [72] SHALE. [200] [55] [272] SANDSTONE. [28] [50] [300]	
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above		
Screen Material Type:			
Slot Length Set Between			
0.00 0.00 ft. 0.00 ft. and 0.00 ft.			
Fittings: None			
Well Grouted: Yes	Grouting Method: Unknown	Drilling Machine Operator Name: Syd Dulaney 02/05/90	
Grouting Material Bags Additives Depth			
Other 0.00 None 0.00 ft. to 0.00 ft.			
Wellhead Completion: Pitless adapter			
Employment: Unknown		Contractor Type: Unknown Reg No: 33-0050	
		Business Name:	
		Business Address:	
		Water Well Contractor's Certification	
		This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
		Signature of Registered Contractor	Date

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: Syd Dulaney 02/05/90		
Type Distance Direction	Employment: Unknown		
Septic tank 55 ft. North	Contractor Type: Unknown Reg No: 33-0050		
	Business Name:		
	Business Address:		

Abandoned Well Plugged: No	Water Well Contractor's Certification		
Reason Not Plugged:	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.		
	Signature of Registered Contractor	Date	

General Remarks:
Other Remarks: Grouting Material 1:Well grouted material unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030303006

Tax No:	Permit No:	County: Eaton	Township: Windsor		
Well ID: 23000003777		Town/Range: 03N 03W	Section: 3	Well Status:	WSSN:
		Source ID/Well No:			
Elevation: 900 ft. Latitude: 42.674621 Longitude: -84.649708 Method of Collection: QQQ - Centroid		Distance and Direction from Road Intersection:			
		Well Owner: DARIN NARAMOR			
		Well Address: DIMONDALE, MI 48821		Owner Address: DIMONDALE, MI 48821	

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 216.00 ft.	Date Completed: 5/23/1989	Pump Installation Date:	HP: 0.50
Well Type: Replacement	Height:	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Unknown		Drop Pipe Length: 80.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 88.00 ft. depth		Draw Down Seal Used: No	
Borehole: 7.80 in. to 88.00 ft. depth		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 45.00 ft. Below Grade	Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 215.00 ft. after 1.00 hrs. at 40 GPM		Sand & Gravel	30.00	30.00
		Gray Clay & Gravel	35.00	65.00
		Black & Gray Shale	5.00	70.00

Screen Installed: Yes	Filter Packed: No	Gray Shale	20.00	90.00
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	Gray Shale & Sandstone	110.00	200.00
Screen Material Type:		Black Shale	5.00	205.00
Slot Length Set Between		Black Shale & Sandstone White	11.00	216.00
0.00 0.00 ft. 0.00 ft. and 0.00 ft.				
Fittings: None				

Well Grouted: Yes	Grouting Method: Unknown	Geology Remarks:		
Grouting Material: Other	Bags: 0.00	Additives: None	Depth: 0.00 ft. to 0.00 ft.	SAND & GRAVEL. [30] [25] [30] GRAY CLAY & GRAVEL. [35] [17] [65] GRAY & BLACK SHALE. [5] [55] [70] GRAY SHALE. [20] [55] [90] GRAY SHALE & SANDSTONE. [110] [56] [200] BLACK SHALE. [5] [55] [205] BLACK SHALE & WHITE SANDSTONE. [11] [56] [216]

Wellhead Completion: Pitless adapter	
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Nearest Source of Possible Contamination:	Drilling Machine Operator Name: CORNELL & SONS
Type: Unknown	Employment: Unknown
Distance: 0 ft.	Contractor Type: Unknown
Direction: Unknown	Reg No: 43-0819

Abandoned Well Plugged: No	Business Name:
Reason Not Plugged:	Business Address:

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks: Grouting Material 1:Unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030303007

Tax No:	Permit No:	County: Eaton	Township: Windsor			
Well ID: 23000003778 Elevation: 900 ft. Latitude: 42.670986 Longitude: -84.644768 Method of Collection: QQQ - Centroid		Town/Range: 03N 03W	Section: 3	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection: .5 MI E OF CANAL RD 100' N OF BILLWOOD HWY				
		Well Owner: HOWARD AMMERMAN				
		Well Address: DIMONDALE, MI 49348		Owner Address: DIMONDALE, MI 49348		

Drilling Method: Cable Tool	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 408.00 ft.	Date Completed: 10/6/1975	Pump Installation Date:	HP: 0.33
Well Type: Unknown	Height: 80.00 ft. above grade	Manufacturer: Other	Pump Type: Submersible
Casing Type: Unknown	Casing Joint: Threaded & coupled	Model Number:	Pump Capacity: 5 GPM
Casing Fitting: Drive shoe	Diameter: 4.00 in. to 80.00 ft. depth	Drop Pipe Length: 70.00 ft.	Pump Voltage:
Borehole:		Drop Pipe Diameter:	Drilling Record ID:
		Draw Down Seal Used: No	
		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 51.00 ft. Below Grade	Yield Test Method: Unknown	Formation Description		Thickness	Depth to Bottom
Well Yield Test:		Clay	16.00	16.00	
	Clay Sandy	28.00	44.00		
	Sand	14.00	58.00		
	Clay	12.00	70.00		
	Shale	81.00	151.00		
	Sandstone	4.00	155.00		
	Shale	253.00	408.00		

Screen Installed: Yes	Filter Packed: No	Geology Remarks:	
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	CLAY. [16] [10] [16] SANDY CLAY. [28] [13] [44] SAND. [14] [20] [58] CLAY. [12] [10] [70] SHALE. [81] [55] [151] SANDSTONE. [4] [54] [155] SHALE. [253] [55] [408]	
Screen Material Type:	Slot Length Set Between:		
0.00	0.00 ft. 0.00 ft. and 0.00 ft.		
Fittings: None			
Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material: Unknown	Bags Additives Depth: 0.00 None 0.00 ft. to 0.00 ft.		
Wellhead Completion: Pitless adapter			

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: RINGLE WELL DRILLING
Type: Sewer line	Employment: Unknown
Distance: 70 ft.	Direction: North
Abandoned Well Plugged: No	Contractor Type: Unknown
Reason Not Plugged:	Reg No:
	Business Name:
	Business Address:
	Water Well Contractor's Certification
	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.
	Signature of Registered Contractor
	Date

General Remarks:
Other Remarks: Pump Manufacturer:F. E. MYERS



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030303008

Tax No:	Permit No:	County: Eaton			Township: Windsor		
Well ID: 23000003779		Town/Range: 03N 03W	Section: 3	Well Status:	WSSN:	Source ID/Well No:	
		Distance and Direction from Road Intersection: 1/4 MI NE OF CANAL ON 78 E SIDE					
Elevation: 900 ft.		Well Owner: DONS TRUCK STOP					
Latitude: 42.6723328466		Well Address:			Owner Address:		
Longitude: -84.6596669153		DIMONDALE, MI 49348			DIMONDALE, MI 49348		
Method of Collection: Loran C							

Drilling Method: Rotary	Well Use: Other	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 180.00 ft.	Date Completed:	Pump Installation Date:	HP: 0.50
Well Type: Unknown	Height:	Manufacturer: Other	Pump Type: Submersible
Casing Type: Unknown		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 84.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 90.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 50.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test:			
Yield Test Method: Unknown	Clay	30.00	30.00
	Sand & Clay	50.00	80.00
	Shale & Sandstone	100.00	180.00

Screen Installed: Yes	Filter Packed: No
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above
Screen Material Type:	
Slot	Length
0.00	0.00 ft.
Set Between	0.00 ft. and 0.00 ft.
Fittings: None	

Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material	Bags	Additives	Depth
Other	0.00	None	0.00 ft. to 0.00 ft.
Geology Remarks: CLAY. [30] [10] [30] SAND AND CLAY. [50] [27] [80] SHALE & SAND ROCK. [100] [56] [180]			

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:			Drilling Machine Operator Name: KLEINFELT
Type	Distance	Direction	Employment: Unknown
Sewer line	100 ft.	Northwest	
Abandoned Well Plugged: No			Contractor Type: Unknown
Reason Not Plugged:			Reg No: 23-0107
			Business Name:
			Business Address:

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks: Well Use:Commercial, Grouting Material 1:Unknown, Pump Manufacturer:RAPIDAYTON



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030303009

Tax No:	Permit No:	County: Eaton	Township: Windsor			
Well ID: 23000003780 Elevation: 898 ft. Latitude: 42.6698318423 Longitude: -84.6581701931 Method of Collection: Loran C		Town/Range: 03N 03W	Section: 3	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection: LAST HOUSE ON N SIDE OF PATS DRIVE W END OF ROAD				
		Well Owner: DAVID BYERS				
		Well Address: 7099 PATS DR DIMONDALE, MI 48821		Owner Address: 4601 PARES RD DIMONDALE, MI 48821		

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 182.00 ft.	Date Completed: 3/16/1989	Pump Installation Date:	HP: 0.50
Well Type: Replacement	Height:	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 0 GPM
Casing Joint: Unknown		Drop Pipe Length: 105.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 119.00 ft. depth		Draw Down Seal Used: No	
Borehole: 7.80 in. to 119.00 ft. depth		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 57.00 ft. Below Grade Well Yield Test: Pumping level 0.00 ft. after 0.00 hrs. at 30 GPM Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
	Red Clay	15.00	15.00
	Gray Clay & Gravel	58.00	73.00
	Black Shale Soft	43.00	116.00
	White Sandstone W/Cobbles Black	66.00	182.00

Screen Installed: Yes	Filter Packed: No	Geology Remarks:	
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	RED CLAY. [15] [10] [15] GREY CLAY & GRAVEL. [58] [17] [73] SOFT BLACK SHALE. [43] [55] [116] WHITE SANDSTONE WITH STRIPS OF BLACK ROCK. [66] [53] [182]	
Screen Material Type:			
Slot	Length	Set Between	
0.00	0.00 ft.	0.00 ft. and 0.00 ft.	
Fittings: None			
Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material	Bags	Additives	Depth
Bentonite slurry	0.00	None	0.00 ft. to 0.00 ft.
Wellhead Completion: Pitless adapter			

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: VANWORMER WELL DRILLING
Type	Employment: Unknown
Unknown	
Distance	Contractor Type: Unknown
0 ft.	Reg No: 19-0676
Direction	Business Name:
Unknown	Business Address:

Abandoned Well Plugged: Yes	Water Well Contractor's Certification
	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.
Casing Removed:	Signature of Registered Contractor
	Date

General Remarks:
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030303034

Tax No: 23080003400015	Permit No:	County: Eaton	Township: Windsor			
Well ID: 23000003784		Town/Range: 03N 03W	Section: 3	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection: 300' W OF CREYTS RD				
Elevation: 1899 ft.		Well Owner: LULU GARRISON				
Latitude: 42.676156		Well Address: 7489 CREYTS RD LANSING, MI 48917		Owner Address: 7489 CREYTS RD LANSING, MI 48917		
Longitude: -84.652162						
Method of Collection: Section - Centroid						

Drilling Method: Cable Tool	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 175.00 ft.	Date Completed: 4/22/1994	Pump Installation Date:	HP: 2.00
Well Type: New	Height:	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 30 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 100.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 170.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 34.00 ft. Below Grade	Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 100.00 ft. after 0.50 hrs. at 45 GPM		Clay & Sand	18.00	18.00
		Gravel	4.00	22.00
		Sandstone	10.00	32.00
		Gravel	4.00	36.00
		Shale	14.00	50.00
		Gravel	3.00	53.00
		Shale	117.00	170.00
		Green Sandstone	5.00	175.00

Screen Installed: Yes	Filter Packed: No	Geology Remarks:	
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	CLAY & SAND. [18] [16] [18] GRAVEL. [4] [30] [22] SANDROCK. [10] [54] [32]	
Screen Material Type:		GRAVEL. [4] [30] [36] SHALE. [14] [55] [50] GRAVEL. [3] [30] [53] SHALE.	
Slot Length Set Between		[117] [55] [170] GREEN SANDROCK. [5] [54] [175]	
0.00 0.00 ft. 0.00 ft. and 0.00 ft.			
Fittings: None			

Well Grouted: Yes	Grouting Method: Unknown	
Grouting Material: Bentonite slurry	Bags: 0.00	Additives: None
	Depth: 0.00 ft. to 25.00 ft.	
Wellhead Completion: Other		

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: STEVE
Type: Septic tank	Employment: Unknown
Distance: 60 ft.	Contractor Type: Unknown
Direction: South	Reg No: 19-1733

Business Name:	Business Address:
Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks: Wellhead Completion: Approved Pit



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030303035

Tax No: 23080050800700	Permit No:	County: Eaton	Township: Windsor		
Well ID: 23000003785		Town/Range: 03N 03W	Section: 3	Well Status:	WSSN:
		Source ID/Well No:			
Elevation: 1899 ft.		Distance and Direction from Road Intersection: 3/4 M E OF CANAL HWY ON THE SOUTH SIDE			
Latitude: 42.681558		Well Owner: JOHN WILLIAMSON			
Longitude: -84.649734		Well Address: 9744 BILLWOOD HWY LANSING, MI 48917		Owner Address: 9744 BILLWOOD HWY LANSING, MI 48917	
Method of Collection: QQQ - Centroid					

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 231.00 ft.	Date Completed: 8/23/1994	Pump Installation Date:	HP: 0.50
Well Type: New	Height:	Manufacturer: Other	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 15 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 60.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 80.00 ft. depth		Draw Down Seal Used: No	
Borehole: 8.00 in. to 80.00 ft. depth		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 25.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 0.00 ft. after 0.00 hrs. at 40 GPM			
Yield Test Method: Unknown	Clay & Stones	28.00	28.00
	Clay & Sand	37.00	67.00
	Shale	11.00	78.00
	Shale & Sandstone	8.00	86.00
	Shale	23.00	109.00
	Lithology Unknown	19.00	128.00
	Shale	51.00	171.00
	Shale & Sandstone	13.00	172.00
	Shale	18.00	210.00
	Sandstone	21.00	231.00

Screen Installed: Yes	Filter Packed: No	Geology Remarks:	
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	CLAY & STONES. [28] [10] [28] CLAY & SAND. [37] [16] [67] SHALE. [11] [55]	
Screen Material Type:		[78] SHALE & SANDROCK. [8] [56] [86] SHALE. [23] [55] [109] . [19] [0] [128]	
Slot Length Set Between		SHALE. [51] [55] [171] SHALE & SANDROCK. [13] [56] [172] SHALE. [18] [55]	
0.00 0.00 ft. 0.00 ft. and 0.00 ft.		[210] SANDROCK. [21] [54] [231]	
Fittings: Neoprene packer			
Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material Bags Additives Depth			
Bentonite slurry 0.00 None 0.00 ft. to 80.00 ft.			
Wellhead Completion: Pitless adapter			

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: STEVE PUNG
Type Distance Direction	Employment: Unknown
Septic tank 50 ft. South	Contractor Type: Unknown Reg No: 19-1868
	Business Name:
	Business Address:
	Water Well Contractor's Certification
	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.
	Signature of Registered Contractor Date

General Remarks:
Other Remarks: Pump Manufacturer:F. E. MYERS



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030304002

Tax No:	Permit No:	County: Eaton	Township: Windsor		
Well ID: 23000003790		Town/Range: 03N 03W	Section: 4	Well Status:	WSSN:
		Source ID/Well No:			
Elevation: 895 ft.		Distance and Direction from Road Intersection:			
Latitude: 42.6701061707		Aquifer: ROCK Well #: 230500402			
Longitude: -84.6620274817		Well Owner:			
Method of Collection: Interpolation-Map		Well Address: 3 BLKS N-M78,1 BLK W-CANAL MI		Owner Address:	

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 260.00 ft.	Date Completed: 5/22/1978	Pump Installation Date:	HP:
Well Type: Unknown	Height:	Manufacturer: Unknown	Pump Type: Unknown
Casing Type: Unknown		Model Number:	Pump Capacity: 14 GPM
Casing Joint: Unknown		Drop Pipe Length: 0.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 176.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 32.00 ft. Below Grade	Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
Well Yield Test:		Gravel & Clay	34.00	34.00
		Sand & Clay	56.00	90.00
		Gravel & Clay	40.00	130.00
		Gravel & Clay	32.00	162.00
		Sandstone W/Shale	78.00	240.00
		Sandstone	20.00	260.00

Screen Installed: Yes	Filter Packed: No	Geology Remarks:	
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	GRAVEL/CLAY. [34] [31] [34] SAND/CLAY. [56] [28] [90] GRAVEL/CLAY. [40] [31] [130] GRAVEL/CLAY. [32] [31] [162] SANDSTONE/SHALE. [78] [52] [240] SANDSTONE. [20] [50] [260]	
Screen Material Type:	Set Between		
Slot	Length		
0.00	0.00 ft.	0.00 ft. and 0.00 ft.	
Fittings: None			
Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material	Bags	Additives	Depth
Other	0.00	None	0.00 ft. to 0.00 ft.
Wellhead Completion: Pitless adapter			

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: Syd Dulaney	02/05/90
Type	Distance	Direction
Sewer line	100 ft.	East
Employment: Unknown	Contractor Type: Unknown	Reg No: 34-0383

Abandoned Well Plugged: No	Business Name:
Reason Not Plugged:	Business Address:
	Water Well Contractor's Certification
	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.
	Signature of Registered Contractor
	Date

General Remarks:
Other Remarks: Grouting Material 1:Well grouted material unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23030304003

Tax No: 23070011400061	Permit No:	County: Eaton	Township: Windsor			
Well ID: 23000003791		Town/Range: 03N 03W	Section: 4	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection: 1/4 MI S OF DAVIS HWY ON EAST SIDE				
Elevation: 1899 ft.		Well Owner: RODNEY SUTFIN				
Latitude: 42.681461		Well Address: 7852 GUINEA RD DIMONDALE, MI 48821		Owner Address: 7852 GUINEA RD DIMONDALE, MI 48821		
Longitude: -84.679251						
Method of Collection: QQQ - Centroid						

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 145.00 ft.	Date Completed: 11/19/1998	Pump Installation Date:	HP: 0.50
Well Type: New	Height:	Manufacturer: Other	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 12 GPM
Casing Joint: Welded		Drop Pipe Length: 60.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 105.00 ft. depth		Draw Down Seal Used: No	
Borehole: 8.00 in. to 105.00 ft. depth		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 22.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 0.00 ft. after 0.00 hrs. at 40 GPM			
Yield Test Method: Unknown	Brown Clay	21.00	21.00
	Gray Clay & Stones Sandy	53.00	74.00
	Gravel Cemented	13.00	87.00
	Shale & Sandstone	31.00	118.00
	Sandstone	27.00	145.00

Screen Installed: Yes	Filter Packed: No	Geology Remarks:	
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	BROWN CLAY. [21] [11] [21] GREY SANDY CLAY STONES. [53] [13] [74]	
Screen Material Type:		GRAVEL CEMENTED. [13] [30] [87] SHALE & SANDROCK. [31] [55] [118]	
Slot Length Set Between		SANDROCK. [27] [54] [145]	
0.00 0.00 ft. 0.00 ft. and 0.00 ft.			
Fittings: None			
Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material Bags Additives Depth			
Bentonite slurry 0.00 None 0.00 ft. to 105.00 ft.			
Wellhead Completion: Other			

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: MATT EWING
Type Distance Direction	Employment: Unknown
Septic tank 50 ft. Southwest	Contractor Type: Unknown Reg No: 23-1612
	Business Name:
	Business Address:
	Water Well Contractor's Certification
	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.
	Signature of Registered Contractor Date

General Remarks:

Other Remarks: Wellhead Completion:Approved Pit, Pump Manufacturer:F. E. MYERS



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040328005

Tax No:	Permit No:	County: Eaton			Township: Delta	
Well ID: 23000006061		Town/Range: 04N 03W	Section: 28	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection:				
		Well Owner: LARVE W STUCK				
Elevation: 880 ft.		Well Address: 7900 E MT HOPE RD LANSING, MI 48917			Owner Address: 7900 E MT HOPE RD LANSING, MI 48917	
Latitude: 42.699369						
Longitude: -84.664557						
Method of Collection: QQQ - Centroid						

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 200.00 ft.	Date Completed: 5/27/1970	Pump Installation Date:	HP: 0.50
Well Type: New	Height: 0.00 ft. below grade	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: Steel - black		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 63.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 104.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 35.00 ft. Below Grade Well Yield Test: Pumping level 50.00 ft. after 1.00 hrs. at 30 GPM Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
	Clay W/Sand	95.00	95.00
	Shale	5.00	100.00
	White Sandstone	6.00	106.00
	Gray Shale	19.00	125.00
	White Sandstone	75.00	200.00

Screen Installed: Yes	Filter Packed: No		
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above		
Screen Material Type:			
Slot	Length	Set Between	
0.00	0.00 ft.	0.00 ft. and 0.00 ft.	
Fittings: None			
Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material	Bags	Additives	Depth
Bentonite slurry	0.00	None	0.00 ft. to 104.00 ft.
Wellhead Completion: Pitless adapter			

Nearest Source of Possible Contamination:			Drilling Machine Operator Name: GILBERT & INGALLS
Type	Distance	Direction	Employment: Unknown
Unknown	0 ft.	Unknown	
			Contractor Type: Unknown
			Reg No: 19-0408
			Business Name:
			Business Address:
Water Well Contractor's Certification			
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.			
Signature of Registered Contractor			Date

General Remarks:
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040328010

Tax No: 23040028300060	Permit No:	County: Eaton	Township: Delta			
Well ID: 23000006066		Town/Range: 04N 03W	Section: 28	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection:				
Elevation: 1899 ft.		Well Owner: GEORGE PARISH				
Latitude: 42.697734		Well Address: 8200 MILLETT HWY LANSING, MI 48917		Owner Address: 8200 MILLETT HWY LANSING, MI 48917		
Longitude: -84.67434						
Method of Collection: Address Matching-House Number						

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 200.00 ft.	Date Completed: 2/22/1996	Pump Installation Date:	HP: 0.50
Well Type: Replacement	Height:	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Welded		Drop Pipe Length: 60.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 85.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 22.00 ft. Below Grade	Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 60.00 ft. after 0.50 hrs. at 25 GPM		Clay & Sand	30.00	30.00
		Clay	32.00	62.00
		Shale	53.00	115.00
Screen Installed: Yes	Filter Packed: No	Sandstone & Shale	25.00	140.00
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	Shale	30.00	170.00
Screen Material Type:		Shale & Sandstone	30.00	200.00
Slot Length Set Between				
0.00 0.00 ft. 0.00 ft. and 0.00 ft.				
Fittings: None				
Well Grouted: Yes	Grouting Method: Unknown			
Grouting Material	Bags	Additives	Depth	
Other	0.00	None	0.00 ft. to 85.00 ft.	

Wellhead Completion: Pitless adapter	Geology Remarks: CLAY & SAND. [30] [16] [30] CLAY. [32] [10] [62] SHALE. [53] [55] [115] SANDROCK & SHALE. [25] [54] [140] SHALE. [30] [55] [170] SHALE & SANDROCK. [30] [56] [200]
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Nearest Source of Possible Contamination:	Drilling Machine Operator Name: STEVE
Type	Employment: Unknown
Septic tank	
Distance	Contractor Type: Unknown
65 ft.	Reg No: 19-1733
Direction	Business Name:
West	Business Address:

Abandoned Well Plugged: No	Water Well Contractor's Certification
Reason Not Plugged:	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.

General Remarks:	Signature of Registered Contractor	Date
Other Remarks: Grouting Material 1:Unknown		



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040333001

Tax No:	Permit No:	County: Eaton		Township: Delta		
Well ID: 23000006099		Town/Range: 04N 03W	Section: 33	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection:				
		Well Owner: THERRIAN BROS BLDRS				
Elevation: 870 ft.		Well Address: 8407 W MILLETT LANSING, MI 48917		Owner Address: 7730 W ST JOE GRAND LEDGE, MI 48837		
Latitude: 42.697166068						
Longitude: -84.6746695607						
Method of Collection: Loran C						

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 191.00 ft.	Date Completed: 9/9/1970	Pump Installation Date:	HP: 0.75
Well Type: New		Manufacturer: Aermotor	Pump Type: Submersible
Casing Type: Steel - black	Height:	Model Number:	Pump Capacity: 15 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 42.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 62.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 25.00 ft. Below Grade	Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 0.00 ft. after 0.00 hrs. at 30 GPM		Clay	15.00	15.00
		Sand	25.00	40.00
		Hardpan	15.00	55.00
Screen Installed: Yes	Filter Packed: No	Shale Soft	6.00	61.00
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	Shale	99.00	160.00
Screen Material Type:		Unidentified Consolidated Fm	31.00	191.00
Slot	Length			
0.00	0.00 ft.			
	Set Between			
	0.00 ft. and 0.00 ft.			
Fittings: None				
Well Grouted: Yes	Grouting Method: Unknown			
Grouting Material	Bags	Additives	Depth	
Other	0.00	None	0.00 ft. to 0.00 ft.	

Wellhead Completion: Pitless adapter	Geology Remarks: CLAY. [15] [10] [15] SAND. [25] [20] [40] HARD PAN. [15] [18] [55] SOFT SHALE. [6] [55] [61] SHALE. [99] [55] [160] ROCK. [31] [59] [191]
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Nearest Source of Possible Contamination:	Drilling Machine Operator Name: DAILY & JACKSON
Type	Employment: Unknown
Septic tank	
Distance	Contractor Type: Unknown
60 ft.	Reg No: 33-0390
Direction	Business Name:
Unknown	Business Address:

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks: Grouting Material 1:Well grouted material unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040333002

Tax No:	Permit No:	County: Eaton			Township: Delta	
Well ID: 23000006100 Elevation: 1899 ft. Latitude: 42.68481 Longitude: -84.664522 Method of Collection: QQQ - Centroid		Town/Range: 04N 03W	Section: 33	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection:				
		Well Owner: JAMES GADSON				
Well Address: 8627 N CANAL RD LANSING, MI 48917				Owner Address: 8627 N CANAL RD LANSING, MI 48917		

Drilling Method: Rotary	Well Use: Household	Pump Installed: No
Well Depth: 280.00 ft.	Date Completed:	Pressure Tank Installed: No
Well Type: New		Pressure Relief Valve Installed: No
Casing Type: Steel - black	Height:	
Casing Joint: Threaded & coupled		
Casing Fitting: Drive shoe		
Diameter: 4.00 in. to 108.00 ft. depth		
Borehole:		

Static Water Level: 21.00 ft. Below Grade	Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
Well Yield Test:		Sand & Clay	40.00	40.00
		Shale	240.00	280.00

Screen Installed: Yes	Filter Packed: No
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above
Screen Material Type:	
Slot	Length
0.00	0.00 ft.
Set Between	
	0.00 ft. and 0.00 ft.
Fittings: None	

Well Grouted: Yes	Grouting Method: Unknown
Grouting Material	Bags
Other	0.00
Additives	Depth
None	0.00 ft. to 0.00 ft.
Geology Remarks: SAND AND CLAY. [40] [16] [40] SHALE. [240] [55] [280]	

Wellhead Completion: 12 inches above grade

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: KLEINFELT
Type	Employment: Unknown
Sewer line	
Distance	Contractor Type: Unknown
60 ft.	Reg No: 23-0107
Direction	Business Name:
West	Business Address:

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks: Grouting Material 1:Well grouted material unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040333004

Tax No:	Permit No:	County: Eaton	Township: Delta			
Well ID: 23000006102		Town/Range: 04N 03W	Section: 33	Well Status:	WSSN:	
		Source ID/Well No:				
		Distance and Direction from Road Intersection:				
Elevation: 1899 ft.		Well Owner: DONALD CARNS				
Latitude: 42.683068		Well Address: 8745 DAVIS HWY LANSING, MI 48917		Owner Address: 8745 DAVIS HWY LANSING, MI 48917		
Longitude: -84.666539						
Method of Collection: Address Matching-House Number						

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 325.00 ft.	Date Completed: 8/29/1995	Pump Installation Date:	HP: 0.50
Well Type: New		Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: PVC plastic	Height:	Model Number:	Pump Capacity: 12 GPM
Casing Joint: Welded		Drop Pipe Length: 40.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 120.00 ft. depth		Draw Down Seal Used: No	
Borehole: 8.50 in. to 120.00 ft. depth		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 12.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 0.00 ft. after 0.00 hrs. at 80 GPM			
Yield Test Method: Unknown	Brown Clay	10.00	10.00
	Gray Sand	25.00	35.00
	Gray Clay W/Gravel	55.00	90.00
	Gray Shale	17.00	107.00
	Black Shale	1.00	108.00
	White Shale & Sandstone	2.00	110.00
	Gray Shale & Sandstone	70.00	180.00
	Sandstone	10.00	190.00
	Black & Gray Shale	20.00	210.00
	Sandstone	5.00	215.00
	Black & Gray Shale	25.00	240.00
	Sandstone W/Shale	85.00	325.00

Screen Installed: Yes	Filter Packed: No
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above
Screen Material Type:	
Slot Length Set Between	
0.00 0.00 ft. 0.00 ft. and 0.00 ft.	
Fittings: None	

Well Grouted: Yes	Grouting Method: Unknown
Grouting Material Bags Additives Depth	
Bentonite slurry 0.00 None 0.00 ft. to 120.00 ft.	
Wellhead Completion: Pitless adapter	

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: GREG MEAD
Type Distance Direction	Employment: Unknown
Septic tank 80 ft. East	

(Continued on page 2)

General Remarks: 12" ABOVE GRADE

Other Remarks:



Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.
Failure to comply is a misdemeanor.



Import ID: 23040333004

Tax No:	Permit No:	County: Eaton	Township: Delta			
Well ID: 23000006102 Elevation: 1899 ft. Latitude: 42.683068 Longitude: -84.666539 Method of Collection: Address Matching-House Number		Town/Range: 04N 03W	Section: 33	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection:				
		Well Owner: DONALD CARNS				
Well Address: 8745 DAVIS HWY LANSING, MI 48917			Owner Address: 8745 DAVIS HWY LANSING, MI 48917			

(Continued from Page 1)			GEOLOGY REMARKS: [55] [210] SANDSTONE. [5] [50] [215] BLACK & GRAY SHALE. [25] [55] [240] SANDSTONE W/LAYERS OF SHALE. [85] [52] [325]
Formation Description	Thickness	Depth to Bottom	
			GEOLOGY REMARKS: [55] [210] SANDSTONE. [5] [50] [215] BLACK & GRAY SHALE. [25] [55] [240] SANDSTONE W/LAYERS OF SHALE. [85] [52] [325]
Contractor Type: Unknown Reg No: 23-0418 Business Name: Business Address:			
Water Well Contractor's Certification			
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.			
Signature of Registered Contractor Date			



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040333005

Tax No: 23040033400090		Permit No:		County: Eaton		Township: Delta		
Well ID: 23000006103 Elevation: 1899 ft. Latitude: 42.683076 Longitude: -84.665084 Method of Collection: Address Matching-House Number				Town/Range:	Section:	Well Status:	WSSN:	Source ID/Well No:
				Distance and Direction from Road Intersection:				Well Owner: BEN PARKER
				Well Address:		Owner Address:		
				8833 DAVIS HWY LANSING, MI 48917		8833 DAVIS HWY LANSING, MI 48917		

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 200.00 ft.	Date Completed: 11/2/1996	Pump Installation Date:	HP: 0.75
Well Type: New	Height:	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 18 GPM
Casing Joint: Welded		Drop Pipe Length: 60.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 104.00 ft. depth		Draw Down Seal Used: No	
Borehole: 7.78 in. to 104.00 ft. depth		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 29.00 ft. Below Grade	Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 0.00 ft. after 0.00 hrs. at 35 GPM				
Screen Installed: Yes	Filter Packed: No	Clay	52.00	52.00
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	Gravel	2.00	54.00
Screen Material Type:		Clay	22.00	76.00
Slot Length Set Between		Lithology Unknown	20.00	98.00
0.00 0.00 ft. 0.00 ft. and 0.00 ft.		Shale	104.00	200.00
Fittings: None				
Well Grouted: Yes	Grouting Method: Unknown			
Grouting Material	Bags	Additives	Depth	
Bentonite slurry	0.00	None	0.00 ft. to 104.00 ft.	

Wellhead Completion: Pitless adapter	Geology Remarks: CLAY. [52] [10] [52] GRAVEL. [2] [20] [54] CLAY. [22] [10] [76] TILL. [20] [19] [98] SHALE. [104] [55] [200]

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: DOODY
Type	Employment: Unknown
Distance	Contractor Type: Unknown
Direction	Reg No: 78-1616
Septic tank	Business Name:
	Business Address:

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040333006

Tax No:	Permit No:	County: Eaton			Township: Delta	
Well ID: 23000006104 Elevation: 1899 ft. Latitude: 42.683052 Longitude: -84.675288 Method of Collection: Address Matching-House Number		Town/Range: 04N 03W	Section: 33	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection:				
		Well Owner: ROGER LANCASTER				
Well Address: 8313 DAVIS HWY LANSING, MI 48917				Owner Address: 8313 DAVIS HWY LANSING, MI 48917		

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 201.00 ft.	Date Completed: 10/24/1996	Pump Installation Date:	HP: 0.50
Well Type: Replacement	Height:	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Welded		Drop Pipe Length: 80.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 115.00 ft. depth		Draw Down Seal Used: No	
Borehole: 4.50 in. to 201.00 ft. depth		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 35.00 ft. Below Grade Well Yield Test: Pumping level 80.00 ft. after 2.00 hrs. at 50 GPM Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
	Clay	10.00	10.00
Screen Installed: Yes Screen Diameter: 0.00 in. Screen Material Type: Slot Length Set Between: 0.00 0.00 ft. 0.00 ft. and 0.00 ft. Filter Packed: No Blank: 0.00 ft. Above Fittings: None	Clay	50.00	80.00
	Sand & Gravel	20.00	100.00
	Shale & Sandstone	30.00	130.00
	Shale	50.00	180.00
	Sandstone	21.00	201.00

Well Grouted: Yes	Grouting Method: Unknown	Geology Remarks:	
Grouting Material: Bentonite slurry	Bags: 0.00	Additives: None	Depth: 0.00 ft. to 115.00 ft.
CLAY. [10] [10] [10] CLAY & SAND. [20] [16] [30] CLAY. [50] [10] [80] SAND & GRAVEL. [20] [25] [100] SHALE & SANDSTONE. [30] [56] [130] SHALE. [50] [55] [180] SANDSTONE. [21] [50] [201]			

Wellhead Completion: Pitless adapter	Drilling Machine Operator Name: STEVE PUNG
	Employment: Unknown

Nearest Source of Possible Contamination:	Contractor Type: Unknown	Reg No: 19-1733
Type: Septic tank	Distance: 59 ft.	Direction: South
Abandoned Well Plugged: No	Business Name:	
Reason Not Plugged:	Business Address:	

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks: 12" ABOVE GRADE
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040334002

Tax No:	Permit No:	County: Eaton	Township: Delta		
Well ID: 23000006106		Town/Range: 04N 03W	Section: 34	Well Status:	WSSN:
		Source ID/Well No:			
Elevation: 1899 ft. Latitude: 42.694103 Longitude: -84.661887 Method of Collection: Address Matching-House Number		Distance and Direction from Road Intersection:			
		Well Owner: BOARD OF WATER & LIGHT			
		Well Address: 3725 S CANAL RD LANSING, MI 48901		Owner Address: 3725 S CANAL RD LANSING, MI 48901	

Drilling Method: Rotary	Well Use: Other	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 380.00 ft.	Date Completed: 4/17/1998	Pump Installation Date:	HP: 10.00
Well Type: New	Height: 2.00 ft. above grade	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 55 GPM
Casing Joint: Welded		Drop Pipe Length: 306.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 8.00 in. to 104.00 ft. depth		Draw Down Seal Used: No	
Borehole: 12.25 in. to 102.00 ft. depth		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 26.00 ft. Below Grade	Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 183.00 ft. after 10.00 hrs. at 35 GPM		Lithology Unknown Fill	2.00	2.00
		Muck	4.00	6.00
		Brown Clay & Sand	7.00	13.00
Screen Installed: Yes	Filter Packed: No	Gray Clay Gravel Sand	23.00	36.00
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	Black & Gray Shale	58.00	94.00
Screen Material Type:		Gray Shale & Sandstone	75.00	169.00
Slot Length Set Between		Sandstone	12.00	181.00
0.00 0.00 ft. 0.00 ft. and 0.00 ft.		Shale	68.00	249.00
Fittings: None		Sandstone	8.00	257.00
		Gray Shale & Limestone	27.00	284.00
Well Grouted: Yes	Grouting Method: Unknown	Sandstone	9.00	293.00
Grouting Material Bags Additives Depth		Shale	43.00	336.00
Neat cement 0.00 None 0.00 ft. to 100.00 ft.		Sandstone	3.00	339.00

Wellhead Completion: Pitless adapter			
(Continued On Page 2)			
Geology Remarks: (Continued On Page 2)			
FILL. [2] [49] [2] MUCK. [4] [44] [6] BROWN CLAY SAND. [7] [16] [13] GRAY CLAY GRAVEL SAND. [23] [17] [36] GRAY BLACK SHALE. [58] [55] [94] GRAY SHALE SANDSTONE. [75] [50] [169] SANDSTONE. [12] [50] [181] SHALE. [68] [55] [249] SANDSTONE. [8] [50] [257] GRAY SHALE LIMESTONE. [27]			

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: CHRIS FELL
Type Distance Direction	Employment: Unknown
Septic tank 600 ft. Southwest	
	(Continued on page 2)

General Remarks:
Other Remarks: Well Use:Type Use Unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040335003

Tax No: 040035300200	Permit No:	County: Eaton	Township: Delta			
Well ID: 23000006109 Elevation: 872 ft. Latitude: 42.6877355991 Longitude: -84.6375731826 Method of Collection: Interpolation-Map		Town/Range: 04N 03W	Section: 35	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection: Aquifer: ROCK Well #: 230403503				
		Well Owner:		Well Address: 6300 LANSING RD MI		Owner Address:

Drilling Method: Rotary	Well Use: Other	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 340.00 ft.	Date Completed: 4/21/1980	Pump Installation Date:	HP:
Well Type: Unknown	Height:	Manufacturer: Unknown	Pump Type: Unknown
Casing Type: Unknown		Model Number:	Pump Capacity: 28 GPM
Casing Joint: Unknown		Drop Pipe Length: 0.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 95.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 36.00 ft. Below Grade Well Yield Test: Pumping level 101.00 ft. after 1.00 hrs. at 50 GPM Yield Test Method: Unknown	Formation Description	Thickness	Depth to Bottom
	Clay	7.00	7.00
Screen Installed: Yes Screen Diameter: 0.00 in. Screen Material Type: Slot Length Set Between: 0.00 0.00 ft. 0.00 ft. and 0.00 ft. Fittings: None Well Grouted: Yes Grouting Method: Unknown Grouting Material: Other Bags Additives Depth: 0.00 None 0.00 ft. to 0.00 ft.	Gravel & Clay	9.00	16.00
	Gravel	38.00	54.00
	Gravel & Clay	21.00	75.00
	Coal W/Shale	9.00	84.00
	Shale	9.00	93.00
	Sandstone W/Shale	6.00	99.00
	Sandstone	17.00	116.00
	Black Shale Organic	14.00	130.00
	Limestone W/Shale	25.00	155.00
	Sandstone W/Shale	60.00	215.00
	Shale	60.00	275.00
	Sandstone	6.00	281.00

Wellhead Completion: Pitless adapter

Geology Remarks: (Continued On Page 2)
CLAY. [7] [10] [7] GRAVEL/CLAY. [9] [31] [16] GRAVEL. [38] [30] [54] GRAVEL/CLAY. [21] [31] [75] SHALE/COAL. [9] [58] [84] SHALE. [9] [55] [93] SANDSTONE/SHALE. [6] [52] [99] SANDSTONE. [17] [50] [116] BLACK SHALE (ORGANIC RICH). [14] [67] [130] LIME/SHALE. [25] [57] [155] SANDST

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: Syd Dulaney	02/05/90
Type: Septic tank	Distance: 75 ft.	Direction: South
Employment: Unknown		

Abandoned Well Plugged: No

Reason Not Plugged:

General Remarks:

Other Remarks: Well Use:Commercial, Grouting Material 1:Well grouted material unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040335004

Tax No:	Permit No:	County: Eaton			Township: Delta	
Well ID: 23000006110		Town/Range: 04N 03W	Section: 35	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection:				
Elevation: 860 ft.		Well Owner: KENNETH JOHNSTON				
Latitude: 42.6921646111		Well Address: 5750 LANSING RD WAYLAND, MI 49348		Owner Address: 3470 DOBIE RD. MASON, MI 48854		
Longitude: -84.6343923066						
Method of Collection: Loran C						

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 300.00 ft.	Date Completed: 1/10/1978	Pump Installation Date:	HP: 0.50
Well Type: Unknown	Height: 0.00 ft. below grade	Manufacturer: Goulds	Pump Type: Submersible
Casing Type: Steel - black		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 47.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 54.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 40.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test:			
Yield Test Method: Unknown	Clay	19.00	19.00
	Sand & Clay	22.00	41.00
	Shale W/Sandstone	259.00	300.00

Screen Installed: Yes	Filter Packed: No
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above
Screen Material Type:	
Slot	Length
0.00	0.00 ft.
Set Between	0.00 ft. and 0.00 ft.
Fittings: None	

Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material	Bags	Additives	Depth
Bentonite slurry	0.00	None	0.00 ft. to 0.00 ft.
Geology Remarks: CLAY. [19] [10] [19] SAND AND CLAY. [22] [27] [41] SHALE W/STRIPS OF SANDSTONE. [259] [58] [300]			

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:			Drilling Machine Operator Name: CENTRAL DRILLING COMPANY
Type	Distance	Direction	Employment: Unknown
Unknown	0 ft.	Unknown	
Abandoned Well Plugged: No			Contractor Type: Unknown
Reason Not Plugged:			Reg No:
			Business Name:
			Business Address:

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040335008

Tax No:		Permit No:		County: Eaton		Township: Delta		
Well ID: 23000006111 Elevation: 870 ft. Latitude: 42.697399 Longitude: -84.649826 Method of Collection: Address Matching-House Number				Town/Range: 04N 03W	Section: 34	Well Status:	WSSN:	Source ID/Well No:
				Distance and Direction from Road Intersection:				
				Well Owner: CLARK FOUNDATIN				
Well Address: 6851 MILLET RD LANSING, MI 48917				Owner Address: 6851 MILLET RD LANSING, MI 48917				

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 335.00 ft.	Date Completed: 6/26/1974	Pump Installation Date:	HP: 0.50
Well Type: New		Manufacturer: Other	Pump Type: Submersible
Casing Type: Steel - black	Height:	Model Number:	Pump Capacity: 10 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 84.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 76.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 40.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 40.00 ft. after 0.00 hrs. at 20 GPM			
Yield Test Method: Unknown	Clay	20.00	20.00
	Hardpan	32.00	52.00
	Shale	52.00	270.00
	Unidentified Consolidated Fm	15.00	285.00
	Shale	50.00	335.00

Screen Installed: Yes	Filter Packed: No	Geology Remarks:	
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above	CLAY. [20] [10] [20] HARD PAN. [32] [18] [52] SHALE. [52] [55] [270] ROCK. [15] [59] [285] SHALE. [50] [55] [335]	
Screen Material Type:			
Slot	Length	Set Between	
0.00	0.00 ft.	0.00 ft. and 0.00 ft.	
Fittings: None			
Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material	Bags	Additives	Depth
Other	0.00	None	0.00 ft. to 0.00 ft.
Wellhead Completion: Pitless adapter			

Nearest Source of Possible Contamination:			Drilling Machine Operator Name: DAILY & JACKSON
Type	Distance	Direction	Employment: Unknown
Unknown	0 ft.	Unknown	
			Contractor Type: Unknown
			Reg No: 33-0390
			Business Name:
			Business Address:
Water Well Contractor's Certification			
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.			
Signature of Registered Contractor			Date

General Remarks:

Other Remarks: Grouting Material 1:Well grouted material unknown, Pump Manufacturer:FLINT & WALLING



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040335009

Tax No:	Permit No:	County: Eaton			Township: Delta	
Well ID: 23000006112		Town/Range: 04N 03W	Section: 34	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection:				
		Well Owner: TOM SCOZZABONE				
Elevation: 1899 ft.		Well Address: 3712 CREYTS RD LANSING, MI 48917			Owner Address: 3737 LANSING RD LANSING, MI 48917	
Latitude: 42.694398						
Longitude: -84.642508						
Method of Collection: Address Matching-House Number						

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 245.00 ft.	Date Completed: 5/20/1974	Pump Installation Date:	HP: 0.50
Well Type: New		Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: Steel - black	Height:	Model Number:	Pump Capacity: 10 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 59.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 68.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 25.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 0.00 ft. after 0.00 hrs. at 40 GPM			
Yield Test Method: Unknown	Sand & Clay	24.00	24.00
	Gravel	25.00	49.00
	Shale	192.00	241.00
	Sandstone	4.00	245.00

Screen Installed: Yes	Filter Packed: No		
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above		
Screen Material Type:			
Slot	Length	Set Between	
0.00	0.00 ft.	0.00 ft. and 0.00 ft.	
Fittings: None			
Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material	Bags	Additives	Depth
Other	0.00	None	0.00 ft. to 49.00 ft.
Geology Remarks: SAND AND CLAY. [24] [27] [24] GRAVEL. [25] [30] [49] SHALE. [192] [55] [241] SAND ROCK. [4] [54] [245]			

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: VANWORMER WELL DRILLING
Type	Employment: Unknown
None	
Distance	Contractor Type: Unknown
Direction	Reg No: 19-0676
	Business Name:
	Business Address:

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks: Grouting Material 1:Unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID: 23040335019

Tax No:	Permit No:	County: Eaton			Township: Delta	
Well ID: 23000006122		Town/Range: 04N 03W	Section: 34	Well Status:	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection:				
		Well Owner: KENNETH JOHNSTON				
Elevation: 858 ft.		Well Address: 5750 LANSING RD LANSING, MI 48917			Owner Address: 3470 DOBIE RD MASON, MI 48854	
Latitude: 42.6912485284						
Longitude: -84.6339030615						
Method of Collection: Loran C						

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 300.00 ft.	Date Completed: 1/10/1978	Pump Installation Date:	HP: 0.50
Well Type: New	Height: 0.00 ft. below grade	Manufacturer: Goulds	Pump Type: Submersible
Casing Type: Steel - black		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 47.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 54.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 40.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test:			
	Clay	19.00	19.00
	Sand & Clay	22.00	41.00
	Shale W/Sandstone	259.00	300.00

Screen Installed: Yes	Filter Packed: No
Screen Diameter: 0.00 in.	Blank: 0.00 ft. Above
Screen Material Type:	
Slot	Length
0.00	0.00 ft.
Set Between	0.00 ft. and 0.00 ft.
Fittings: None	

Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material	Bags	Additives	Depth
Bentonite slurry	0.00	None	0.00 ft. to 0.00 ft.
Geology Remarks: CLAY. [19] [10] [19] SAND AND CLAY. [22] [27] [41] SHALE WITH FEW STRIPS OF SANDSTONE. [259] [56] [300]			

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: CENTRAL DRILLING CO
Type	Employment: Unknown
Unknown	
Distance	Contractor Type: Unknown
0 ft.	Reg No:
Direction	Business Name:
Unknown	Business Address:

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No: 16476	County: Eaton		Township: Delta	
Well ID: 23000007213		Town/Range: 04N 03W	Section: 35	Well Status: Active	WSSN:
		Source ID/Well No:			
Elevation:		Distance and Direction from Road Intersection: 1 mile east of Lansing Rd. and 80' north of Old Lansing Rd.			
Latitude: 42.69192		Well Owner: Jack Glesson			
Longitude: -84.632244		Well Address: 5638 Old Lansing Rd. Lansing, MI		Owner Address: 5638 Old Lansing Rd. Lansing, MI	
Method of Collection: Address Matching-House Number					

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 320.00 ft.	Date Completed: 9/14/2001	Pump Installation Date: 9/14/2001	HP: 0.50
Well Type: Replacement	Height: 1.00 ft. above grade	Manufacturer: F.E. Myers	Pump Type: Submersible
Casing Type: PVC plastic		Model Number: 2Nf152-12	Pump Capacity: 12 GPM
Casing Joint: Solvent welded/glued		Drop Pipe Length: 120.00 ft.	Pump Voltage:
Casing Fitting: Shale packer/trap		Drop Pipe Diameter: 1.00 in.	Drilling Record ID:
Diameter: 5.00 in. to 61.00 ft. depth		Draw Down Seal Used: No	
Borehole: 4.50 in. to 320.00 ft. depth		Pressure Tank Installed: Yes	
		Pressure Tank Type: Diaphragm/bladder	
		Manufacturer: Well-Rite-Flexcon	
		Model Number: W-80	Tank Capacity: 26.0 Gallons
		Pressure Relief Valve Installed: No	

Static Water Level: 40.00 ft. Below Grade Well Yield Test: Pumping level 100.00 ft. after 1.00 hrs. at 25 GPM Yield Test Method: Air	Formation Description	Thickness	Depth to Bottom
	Clay	9.00	9.00
	Clay & Sand	5.00	14.00
	Clay & Gravel	14.00	28.00

Screen Installed: No Intake: Bedrock Well	Shale	100.00	128.00
	Sandstone	11.00	139.00
	Shale	131.00	270.00
	Sandstone & Shale	15.00	285.00
	Shale	25.00	310.00
	Sandstone	8.00	318.00
	Shale	2.00	320.00

Well Grouted: Yes	Grouting Method: Grout pipe outside casing		
Grouting Material: Bentonite slurry	Bags: 4.00	Additives: Other	Depth: 0.00 ft. to 61.00 ft.
Geology Remarks:			

Wellhead Completion: Pitless adapter, 12 inches above grade
--

Nearest Source of Possible Contamination:			Drilling Machine Operator Name: Steve Pung
Type: Sewer line	Distance: 50 ft.	Direction: West	Employment: Employee
			Contractor Type: Water Well Drilling Contractor Reg No: 34-2246

Abandoned Well Plugged: Yes	Business Name: Johnson Well Drilling
	Business Address: 12577 State Rd
Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Casing Removed:	Signature of Registered Contractor
	Date

General Remarks:
Other Remarks: Grouting Additive 1:Retarder, Map Scale:Unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No: 16843	County: Eaton		Township: Windsor	
Well ID: 23000007617		Town/Range: 03N 03W	Section: 10	Well Status: Active	WSSN:
		Source ID/Well No:			
Elevation: 876 ft.		Distance and Direction from Road Intersection: HILL & HOLLOW SUBDV. LOT#22			
Latitude: 42.66837999		Well Owner: ROBERT HILL BUILDER			
Longitude: -84.65145432		Well Address: 6953 THORNHILL DRIVE DIMONDALE, MI 48821		Owner Address: 755 E. COLUMBIA MASON, MI 48854	
Method of Collection: Address Matching-House Number					

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 180.00 ft.	Date Completed: 6/10/2002	Pump Installation Date: 6/17/2002	HP: 0.50
Well Type: New	Height: 1.00 ft. above grade	Manufacturer: Sta-Rite	Pump Type: Submersible
Casing Type: PVC plastic		Model Number: 10SP40025	Pump Capacity: 12 GPM
Casing Joint: Solvent welded/glued		Drop Pipe Length: 80.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter: 1.00 in.	Drilling Record ID:
Diameter: 5.00 in. to 100.00 ft. depth		Draw Down Seal Used: No	
Borehole: 8.50 in. to 100.00 ft. depth 4.75 in. to 180.00 ft. depth		Pressure Tank Installed: Yes	
		Pressure Tank Type: Diaphragm/bladder	
		Manufacturer: Pro-Source	
		Model Number: 202	Tank Capacity: 20.0 Gallons
		Pressure Relief Valve Installed: No	

Static Water Level: 50.00 ft. Below Grade	Well Yield Test: Pumping level 180.00 ft. after 1.00 hrs. at 80 GPM	Yield Test Method: Air	Formation Description	Thickness	Depth to Bottom
			Brown Clay & Sand	20.00	20.00
			Gray Clay	40.00	60.00
			Gray Shale	15.00	75.00
			Black & Gray Shale	5.00	80.00
			Gray Shale	9.00	89.00
			White Shale	4.00	93.00
			Shale & Sandstone	10.00	103.00
			Gray & White Sandstone W/Shale	77.00	180.00

Screen Installed: No	Intake: Bedrock Well	
Well Grouted: Yes	Grouting Method: Grout pipe outside casing	
Grouting Material: Bentonite slurry	Bags: 5.00	Additives: None
	Depth: 0.00 ft. to 100.00 ft.	

Wellhead Completion: Pitless adapter	Geology Remarks:

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: GREG MEAD/TIM WALTZ
Type: Sewer line	Employment: Employee
Distance: 10 ft.	
Direction: East	

Contractor Type: Water Well Drilling Contractor	Reg No: 23-2227
Business Name: DYER WELL DRILLING&SERVICE,INC	
Business Address: 12520 PEACOCK RD, LAINGSBURG, MI, 48848	

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No: 15470	County: Eaton		Township: Windsor	
Well ID: 23000007703	Town/Range: 03N 03W	Section: 10	Well Status: Active	WSSN:	Source ID/Well No:
	Distance and Direction from Road Intersection: appx. .5 mi W of Creyts rd on S side of Billwood Hwy				
	Well Owner: Perception Development				
Elevation:	Well Address: 9562 Billwood Hwy. Dimondale, MI		Owner Address: 403 S Clinton Grand Ledge, MI 48837		
Latitude: 42.669052					
Longitude: -84.650089					
Method of Collection: Address Matching-House Number					

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 180.00 ft.	Date Completed: 1/22/2001	Pump Installation Date:	HP: 0.50
Well Type: New	Height:	Manufacturer: Aermotor	Pump Type: Submersible
Casing Type: PVC plastic		Model Number: T1250	Pump Capacity: 12 GPM
Casing Joint: Unknown		Drop Pipe Length: 60.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 100.00 ft. depth		Draw Down Seal Used: No	
Borehole: 8.50 in. to 100.00 ft. depth 4.75 in. to 180.00 ft. depth		Pressure Tank Installed: Yes	Tank Capacity: 32.0 Gallons
		Pressure Tank Type: Unknown	
		Manufacturer: Amtrol	
		Model Number: 203	
		Pressure Relief Valve Installed: No	

Static Water Level: 28.00 ft. Below Grade	Yield Test Method: Air	Formation Description	Thickness	Depth to Bottom
		Brown Clay & Gravel	65.00	65.00
Well Yield Test: Pumping level 180.00 ft. at 50 GPM		Gray Clay	8.00	73.00
		Gray Shale	7.00	80.00
Screen Installed: No	Intake: Bedrock Well	Light Gray Shale & Sandstone	22.00	102.00
		Gray & White Sandstone	78.00	180.00

Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material	Bags	Additives	Depth
Bentonite slurry	5.00	None	0.00 ft. to 100.00 ft.

Wellhead Completion: Pitless adapter, 12 inches above grade	Geology Remarks:

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: Derrick Davis
Type	Employment: Employee
Septic tank	
Distance	
70 ft.	
Direction	
Northeast	

Contractor Type: Water Well Drilling Contractor	Reg No: 23-2227
Business Name: Dyer Well Drilling & Services	
Business Address:	

Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No: 16540	County: Eaton			Township: Delta
Well ID: 23000007936	Town/Range: 04N 03W	Section: 33	Well Status: Active	WSSN:	Source ID/Well No:
	Distance and Direction from Road Intersection: 1/4 mile north of Davis Road on the east side of Guinea Road				
	Well Owner: Angelo Infrate				
Elevation:	Well Address: Guinea Road Lansing, MI		Owner Address: 26400 Sherwood Warren, MI 48091		
Latitude: 42.697192					
Longitude: -84.6737067					
Method of Collection: Address Matching-Street Centerline					

Drilling Method: Rotary	Pump Installed: No		
Well Depth: 340.00 ft.	Pressure Tank Installed: No		
Well Use: Household	Pressure Relief Valve Installed: No		
Well Type: New	Date Completed: 11/13/2001		
Casing Type: PVC plastic	Height: 1.00 ft. above grade		
Casing Joint: Welded			
Casing Fitting: None			
Diameter: 5.00 in. to 90.00 ft. depth			
Borehole: 8.75 in. to 90.00 ft. depth 5.88 in. to 100.00 ft. depth 4.75 in. to 340.00 ft. depth			
Static Water Level: 100.00 ft. Below Grade			
Well Yield Test:	Yield Test Method: Air		
Pumping level 340.00 ft. after 1.00 hrs. at 25 GPM			
Screen Installed: No	Intake: Bedrock Well		
	Formation Description	Thickness	Depth to Bottom
	Sand	10.00	10.00
	Clay	50.00	60.00
	Shale	40.00	100.00
	Sandstone	5.00	105.00
	Shale	105.00	210.00
	Sandstone	3.00	213.00
	Shale	115.00	328.00
	Sandstone	6.00	334.00
	Shale	6.00	340.00
Well Grouted: Yes	Grouting Method: Grout pipe outside casing		
Grouting Material: Bentonite slurry	Bags: 9.00	Additives: None	Depth: 0.00 ft. to 90.00 ft.
Geology Remarks:			
Wellhead Completion: 12 inches above grade			
Nearest Source of Possible Contamination:			
Type: None	Distance:	Direction:	
Drilling Machine Operator Name: Dan Cesal			
Employment: Employee			
Contractor Type: Water Well Drilling Contractor			
Reg No: 78-1607			
Business Name: Ed Birkmeier Well Drilling Ltd			
Business Address: 10655 Easton Road, New Lothrop, MI, 48460			
Water Well Contractor's Certification			
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.			
Signature of Registered Contractor			Date
General Remarks: Owner is hooking up system			
Other Remarks: Coordinate Source:Google well address geocoding			



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No: 0647301KA04	Permit No: 16497	County: Eaton		Township: Windsor	
Well ID: 23000007942		Town/Range: 03N 03W	Section: 3	Well Status: Active	WSSN:
		Source ID/Well No:			
Elevation:		Distance and Direction from Road Intersection: 80' EAST OF PATS DR, 750' SOUTH OF LANSING RD			
Latitude: 42.67222194		Well Owner: BRENDA FINCH			
Longitude: -84.65757727		Well Address: 7332 PATS DR DIMONDALE, MI		Owner Address: 980 S MEECH RD DANSVILLE, MI 48819	
Method of Collection: Interpolation-Map					

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 300.00 ft.	Well Type: Replacement	Pump Installation Date:	HP: 0.50
Well Type: Replacement	Date Completed: 10/12/2001	Manufacturer: Goulds	Pump Type: Submersible
Casing Type: PVC plastic	Height: 2.00 ft. above grade	Model Number: 10LS05421	Pump Capacity: 10 GPM
Casing Joint: Solvent welded/glued		Drop Pipe Length: 100.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 157.00 ft. depth		Draw Down Seal Used: No	
Borehole: 8.75 in. to 155.00 ft. depth 4.75 in. to 300.00 ft. depth		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 40.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 100.00 ft. after 0.50 hrs. at 20 GPM			
	Brown Clay	11.00	11.00
	Gravel	5.00	16.00
	Gray Clay	8.00	24.00
Screen Installed: No	Sand W/Gravel Fine	25.00	49.00
Intake: Unknown	Gray Clay	6.00	55.00
	Gravel	8.00	63.00
	Gray Clay	14.00	77.00
	Gray Shale	6.00	83.00
	White Shale & Sandstone	14.00	97.00
	Black Shale	3.00	100.00
	Gray Shale	21.00	121.00
	Gray Sandstone & Shale	48.00	169.00
	Gray Shale	24.00	193.00

Well Grouted: Yes	Grouting Method: Unknown
Grouting Material: Bentonite slurry	Depth: 0.00 ft. to 155.00 ft.
Bags: 7.00	Additives: None

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:
Type: Other
Distance: 40 ft.
Direction: North

Abandoned Well Plugged: Yes
Casing Removed:

(Continued On Page 2)

Geology Remarks:

Drilling Machine Operator Name: FRED WEITLING

Employment: Employee

(Continued on page 2)

General Remarks: DRILLED BY AARDVARK DRLG
Other Remarks: Contamination Source 1:OLD WATER WELL



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No: 14886	County: Eaton		Township: Windsor	
Well ID: 23000008266		Town/Range: 03N 03W	Section: 3	Well Status: Active	WSSN:
		Source ID/Well No:			
Elevation:		Distance and Direction from Road Intersection: 30 FEET WEST OF PATS DRIVE AT DEAD END			
Latitude: 42.671013		Well Owner: RICHARD GOHER			
Longitude: -84.654616		Well Address: 7281 PATS DRIVE MI		Owner Address: 7281 PATS DRIVE MI	
Method of Collection: QQQ - Centroid					

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 200.00 ft.	Date Completed: 12/9/1999	Pump Installation Date:	HP: 10.00
Well Type: Replacement	Height:	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Unknown		Drop Pipe Length:	Pump Voltage:
Casing Fitting: Shale packer/trap		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 94.00 ft. depth		Draw Down Seal Used: No	
Borehole: 4.50 in. to 200.00 ft. depth		Pressure Tank Installed: Yes	
		Pressure Tank Type: Unknown	
		Manufacturer: Well-Rite-Flexcon	
		Model Number: W80	Tank Capacity: 28.0 Gallons
		Pressure Relief Valve Installed: No	

Static Water Level: 30.00 ft. Below Grade	Well Yield Test: Pumping level 100.00 ft. after 0.50 hrs. at 30 GPM	Yield Test Method: Air	Formation Description	Thickness	Depth to Bottom
			Clay & Gravel W/Stones	20.00	20.00
			Sand	10.00	30.00
			Muck W/Clay	20.00	50.00
			Shale	10.00	60.00
			Muck W/Clay	5.00	65.00
			Shale	55.00	120.00
			Sandstone & Shale	20.00	140.00
			Shale	30.00	170.00
			Sandstone	30.00	200.00

Screen Installed: No	Intake: Bedrock Well	Geology Remarks:
Well Grouted: Yes	Grouting Method: Unknown	
Grouting Material: Bentonite slurry	Bags: 6.00	
Additives: None	Depth: 0.00 ft. to 94.00 ft.	

Wellhead Completion: Pitless adapter, 12 inches above grade
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Nearest Source of Possible Contamination:	Drilling Machine Operator Name: STEVE PERRY
Type: Other	Employment: Unknown
Distance: 10 ft.	
Direction: South	
	Contractor Type: Water Well Drilling Contractor
	Reg No: 34-2246
	Business Name: J WELL DRLG
	Business Address:

Abandoned Well Plugged: Yes	Water Well Contractor's Certification This well was drilled under my supervision and this report is true to the best of my knowledge and belief.
Casing Removed:	
	Signature of Registered Contractor
	Date

General Remarks:
Other Remarks: Contamination Source 1:OLD WELL



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No: 10552	County: Eaton		Township: Windsor	
Well ID: 23000008356		Town/Range: 03N 03W	Section: 3	Well Status: Active	WSSN:
		Source ID/Well No:			
Elevation:		Distance and Direction from Road Intersection: 85 FEET EAST OF PATS DR			
Latitude: 42.67318453		Well Owner: CHRIS DAVIS			
Longitude: -84.656051		Well Address: 7382 PATS DRIVE DIMONDALE, MI		Owner Address: 7382 PATS DRIVE DIMONDALE, MI	
Method of Collection: Interpolation-Map					

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 290.00 ft.	Date Completed: 12/23/2002	Pump Installation Date:	HP: 0.50
Well Type: Replacement	Height:	Manufacturer: F.E. Myers	Pump Type: Submersible
Casing Type: PVC plastic		Model Number:	Pump Capacity: 10 GPM
Casing Joint: Unknown		Drop Pipe Length: 100.00 ft.	Pump Voltage:
Casing Fitting: None		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 5.00 in. to 116.00 ft. depth		Draw Down Seal Used: No	
Borehole: 8.00 in. to 116.00 ft. depth		Pressure Tank Installed: Yes	
		Pressure Tank Type: Unknown	
		Manufacturer: Champion	
		Model Number: CM-203	Tank Capacity: 32.0 Gallons
		Pressure Relief Valve Installed: No	

Static Water Level: 62.00 ft. Below Grade	Well Yield Test: Pumping level 320.00 ft. after 0.50 hrs. at 20 GPM	Yield Test Method: Air	Formation Description	Thickness	Depth to Bottom
			Clay	70.00	70.00
Screen Installed: No Intake: Bedrock Well			Gravel & Clay	10.00	80.00
			Shale	30.00	110.00
			Sandstone & Shale	20.00	130.00
			Shale	30.00	160.00
			Sandstone & Shale	70.00	230.00
			Shale	60.00	290.00
			Shale & Sandstone	30.00	320.00

Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material	Bags	Additives	Depth
Bentonite slurry	5.00	None	0.00 ft. to 116.00 ft.
Geology Remarks:			

Wellhead Completion: Pitless adapter	
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Nearest Source of Possible Contamination:	Drilling Machine Operator Name: JASON MANNING
Type	Employment: Subcontractor
Septic tank	
Distance	
Direction	

Abandoned Well Plugged: Yes	Contractor Type: Water Well Drilling Contractor	Reg No: 19-2330
	Business Name: MAURER & PARKS WELL DRLG	
	Business Address:	

Casing Removed:	Water Well Contractor's Certification
	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.
	Signature of Registered Contractor _____ Date _____

General Remarks:
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No:	County: Eaton			Township: Delta	
Well ID: 23000009147		Town/Range: 04N 03W	Section: 27	Well Status: Active	WSSN:	Source ID/Well No:
		Distance and Direction from Road Intersection: N.E CORNER MILLETT HWY & CANAL				
Elevation:		Well Owner: LOWELL SMITH				
Latitude: 42.69829723		Well Address:			Owner Address: 3333 CANAL RD LANSING, MI 48910	
Longitude: -84.66143605						
Method of Collection: Unknown						

Drilling Method: Rotary	Well Use: Unknown	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 270.00 ft.	Date Completed:	Pump Installation Date:	HP: 1.50
Well Type: Unknown		Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: Unknown	Height:	Model Number:	Pump Capacity: 15 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 84.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter: 4.00 in. to 90.00 ft. depth		Draw Down Seal Used: No	
Borehole:		Pressure Tank Installed: No	
		Pressure Relief Valve Installed: No	

Static Water Level: 60.00 ft. Below Grade	Yield Test Method: Air	Formation Description	Thickness	Depth to Bottom
Well Yield Test:		Clay	50.00	50.00
		Shale	210.00	260.00
		Sandstone	10.00	270.00

Screen Installed: No	Intake: Bedrock Well			

Well Grouted: No	Geology Remarks:

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:	Drilling Machine Operator Name:
Type Distance Direction	Employment: Unknown
Septic tank 50 ft. East	

Abandoned Well Plugged: No	Contractor Type: Water Well Drilling Contractor Reg No: 23-0107
	Business Name: CHAS KLEINFELT & SON
	Business Address:

Reason Not Plugged:	Water Well Contractor's Certification
	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.
	Signature of Registered Contractor Date

General Remarks:
Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No: w051091	County: Eaton			Township: Windsor	
Well ID: 23000010081	Town/Range: 03N 03W	Section: 9	Well Status: Active	WSSN: 795	Source ID/Well No: 1-North	
	Distance and Direction from Road Intersection: Blue Water #1 north					
	Well Owner: BLUE WATER VILLAGE					
	Well Address: BLUE WATER 1 Dimondale, MI 48821			Owner Address: STROBEL ROAD DIMONDALE, MI 48821		
Elevation:						
Latitude: 42.658438						
Longitude: -84.679803						
Method of Collection: Interpolation-Aerial Photo						

Drilling Method: Rotary	Well Use: Type I public	Pump Installed: No
Well Depth: 460.00 ft.	Date Completed: 8/17/2004	Pressure Tank Installed: No
Well Type: New	Height: 1.00 ft. above grade	Pressure Relief Valve Installed: No
Casing Type: PVC plastic		
Casing Joint: Solvent welded/glued		
Casing Fitting: None		
Diameter: 6.90 in. to 92.00 ft. depth SDR: 21.00		
Borehole: 10.00 in. to 92.00 ft. depth 5.75 in. to 460.00 ft. depth		

Static Water Level: 31.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test:			
Yield Test Method: Air	Black Clay Sandy	16.00	16.00
Pumping level 260.00 ft. after 1.00 hrs. at 55 GPM	Brown Clay	1.00	17.00
Pumping level 360.00 ft. after 1.00 hrs. at 65 GPM	Gravel & Sand	10.00	27.00
Pumping level 460.00 ft. after 1.00 hrs. at 80 GPM	Gray Clay	11.00	38.00
Screen Installed: No	Sand & Stones W/Gravel	7.00	45.00
Intake: Bedrock Well	Gray Sandstone Soft	6.00	51.00
	Gray Sandstone Hard	19.00	70.00
	Gray & White Shale	5.00	75.00
	Black & Gray Shale	12.00	87.00
	Gray & White Sandstone	11.00	98.00
	Gray Shale & Sandstone	3.00	101.00
	Gray Shale	2.00	103.00
	Black Shale	1.00	104.00

Well Grouted: Yes	Grouting Method: Grout pipe outside casing		
Grouting Material	Bags	Additives	Depth
Neat cement	36.00	None	0.00 ft. to 92.00 ft.

Wellhead Completion: 12 inches above grade

Nearest Source of Possible Contamination:		
Type	Distance	Direction
None		

(Continued On Page 2)

Geology Remarks:

Drilling Machine Operator Name: KEVIN OUELLETTE, JOEL TEVELDE
Employment: Employee

(Continued on page 2)

General Remarks: 75-80GPM@460', 60-65GPM@360', 50-55GPM@260', 25-30GPM@160', 10-15GPM@60'. SEVERAL ITEMS CORRECTED BY DNRE 6/25/2010.

Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:		Permit No: w051091		County: Eaton		Township: Windsor	
Well ID: 23000010081		Town/Range: 03N 03W	Section: 9	Well Status: Active	WSSN: 795	Source ID/Well No: 1-North	
		Distance and Direction from Road Intersection: Blue Water #1 north					
		Well Owner: BLUE WATER VILLAGE					
Elevation:		Well Address:		Owner Address:			
Latitude: 42.658438		BLUE WATER 1		STROBEL ROAD			
Longitude: -84.679803		Dimondale, MI 48821		DIMONDALE, MI 48821			
Method of Collection: Interpolation-Aerial Photo							

(Continued from Page 1)

Formation Description	Thickness	Depth to Bottom
White Shale & Sandstone	4.00	108.00
White Sandstone	5.00	113.00
Gray Shale & Sandstone	7.00	120.00
Gray Shale & Limestone	22.00	142.00
Gray Shale & Sandstone	7.00	149.00
Black Shale W/Pyrite	1.00	150.00
White Shale	4.00	154.00
Gray & White Shale & Sandstone	4.00	158.00
Gray Shale W/Limestone	25.00	183.00
Gray Shale & Sandstone	11.00	194.00
White Sandstone	6.00	200.00
Gray & White Sandstone	8.00	208.00
White Shale	2.00	210.00
White Sandstone	2.00	212.00
Gray & White Shale & Sandstone	3.00	215.00
Gray Sandstone	6.00	221.00
Gray & White Shale & Sandstone	18.00	239.00
Black & Gray Shale	9.00	248.00
Gray Sandstone	9.00	257.00
Black & Gray Shale	13.00	270.00
White Shale & Sandstone	7.00	277.00
Black & Gray Sandstone	12.00	289.00
Gray Shale & Limestone	44.00	333.00
Black Shale W/Pyrite	16.00	349.00
Gray Sandstone	12.00	361.00
Sandstone Cemented	3.00	364.00
Limestone	7.00	371.00
Gray Sandstone	4.00	375.00
Limestone	17.00	392.00
Gray Sandstone	2.00	394.00
Limestone	9.00	403.00
Gray Sandstone	4.00	407.00
Limestone	11.00	418.00
Gray Sandstone	23.00	441.00
Limestone	6.00	447.00
Gray Sandstone	13.00	460.00

Contractor Type: Water Well Drilling Contractor		Reg No: 23-2309	
Business Name: Dyer Well Drilling & Service			
Business Address: 7300 Millett Hwy, Lansing, MI, 48917			
Water Well Contractor's Certification			
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.			
Signature of Registered Contractor			Date



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No: W051091	County: Eaton			Township: Windsor
Well ID: 23000010084	Town/Range: 03N 03W	Section: 9	Well Status: Active	WSSN: 795	Source ID/Well No: 4-East
	Distance and Direction from Road Intersection: BLUE WATER #4 EAST				
	Well Owner: BLUE WATER VILLAGE				
Elevation:	Well Address: BLUE WATER 4 DIMONDALE, MI 48821		Owner Address: STROBEL RD DIMONDALE, MI 48821		
Latitude: 42.658386					
Longitude: -84.679641					
Method of Collection: Interpolation-Aerial Photo					

Drilling Method: Rotary	Well Use: Type I public		Pump Installed: No		
Well Depth: 460.00 ft.	Date Completed: 8/19/2004		Pressure Tank Installed: No		
Well Type: New	Height: 1.00 ft. above grade		Pressure Relief Valve Installed: No		
Casing Type: PVC plastic					
Casing Joint: Solvent welded/glued					
Casing Fitting: None					
Diameter: 6.00 in. to 88.00 ft. depth SDR: 21.00					
Borehole: 10.00 in. to 83.00 ft. depth 5.75 in. to 460.00 ft. depth					
Static Water Level: 16.70 ft. Below Grade	Yield Test Method: Air				
Well Yield Test:	Pumping level 260.00 ft. after 1.00 hrs. at 55 GPM				
	Pumping level 360.00 ft. after 1.00 hrs. at 65 GPM				
	Pumping level 460.00 ft. after 1.00 hrs. at 80 GPM				
Screen Installed: No	Intake: Bedrock Well				
			Formation Description	Thickness	Depth to Bottom
			Black Clay Sandy	13.00	13.00
			Gravel & Sand	11.00	24.00
			Gray Clay & Gravel	11.00	35.00
			Gravel & Sand W/Stones	13.00	48.00
			Gray Sandstone Soft	4.00	52.00
			Gray & White Shale	31.00	83.00
			Gray Sandstone	14.00	97.00
			Black & Gray Shale	7.00	104.00
			Gray Sandstone	5.00	109.00
			Gray Shale & Sandstone	9.00	118.00
			Gray Shale & Limestone	25.00	143.00
			Gray Shale & Sandstone	5.00	148.00
			Black & Gray Shale	2.00	150.00
			(Continued On Page 2)		
			Geology Remarks:		
Wellhead Completion: 12 inches above grade					
Nearest Source of Possible Contamination:			Drilling Machine Operator Name: KEVIN OUELLETTE		
Type	Distance	Direction	Employment: Employee		
None			(Continued on page 2)		

General Remarks: 75-80gpm@460', 60-65gpm@360', 50-55gpm@260', 25-30gpm@160', 10-15gpm@60'. Date of completion and remarks corrected by DNRE 6/25/2010.

Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No: 08335	County: Eaton		Township: Delta	
Well ID: 23000010760		Town/Range: 04N 03W	Section: 33	Well Status: Active	WSSN:
		Source ID/Well No:			
Elevation:		Distance and Direction from Road Intersection: 1/8 mile west of Canel Rd. and 150' north of Davis Hwy.			
Latitude: 42.68337		Well Owner: Pat Wheeler			
Longitude: -84.66569		Well Address: 8809 Davis Hwy Lansing, MI 48917		Owner Address: 8809 Davis Hwy Lansing, MI 48917	
Method of Collection: GPS Differential (DGPS)					

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 300.00 ft.	Date Completed: 6/10/2008	Pump Installation Date: 6/10/2008	HP: 0.50
Well Type: Replacement	Height: 1.00 ft. above grade	Manufacturer: Franklin Electric	Pump Type: Submersible
Casing Type: PVC plastic		Model Number: 10FAO5P4	Pump Capacity: 12 GPM
Casing Joint: Solvent welded/glued		Drop Pipe Length: 80.00 ft.	Pump Voltage:
Casing Fitting: Shale packer/trap		Drop Pipe Diameter: 1.00 in.	Drilling Record ID:
Diameter: 5.00 in. to 125.00 ft. depth SDR: 21.00		Draw Down Seal Used: No	
Borehole: 8.50 in. to 125.00 ft. depth 4.50 in. to 300.00 ft. depth		Pressure Tank Installed: Yes	
		Pressure Tank Type: Diaphragm/bladder	
		Manufacturer: Well-Rite-Flexcon	
		Model Number: PC66	Tank Capacity: 20.0 Gallons
		Pressure Relief Valve Installed: Yes	

Static Water Level: 25.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Pumping level 300.00 ft. after 1.00 hrs. at 20 GPM			
Yield Test Method: Air	Clay & Cobbles	22.00	22.00
	Clay & Gravel	75.00	97.00
	Black & Gray Shale	25.00	122.00
	Sandstone & Shale W/Sandstone	178.00	300.00

Screen Installed: No	Intake: Bedrock Well
Well Grouted: Yes	
Grouting Method: Grout pipe outside casing	
Grouting Material: Bentonite slurry	Depth: 0.00 ft. to 125.00 ft.
Bags: 8.00	Additives: None
Wellhead Completion: Pitless adapter, 12 inches above grade	

Geology Remarks:
Nearest Source of Possible Contamination:
Type: Septic tank
Distance: 50 ft.
Direction: West

Drilling Machine Operator Name: Steve Pung	
Employment: Employee	
Contractor Type: Water Well Drilling Contractor	
Reg No: 34-2246	
Business Name: Johnson Well Drilling	
Business Address: 12577 State Rd Grand, Ledge, MI, 48837	
Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks: Map Scale:Unknown



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No: 04698	County: Eaton		Township: Windsor	
Well ID: 23000010789		Town/Range: 03N 03W	Section: 2	Well Status: Active	WSSN:
		Source ID/Well No:			
Elevation:		Distance and Direction from Road Intersection: 2/10 mile east of Creyts and 5/10 mile south of Lansing Ave.			
Latitude: 42.67768		Well Owner: David Hoisington			
Longitude: -84.63895		Well Address: 7584 Creyts Dimondale, MI 48821		Owner Address: 7584 Creyts Dimondale, MI 48821	
Method of Collection: GPS Std Positioning Svc SA Off					

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 356.00 ft.	Date Completed: 7/30/2008	Pump Installation Date:	HP: 0.75
Well Type: Replacement	Height: 1.00 ft. above grade	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: PVC plastic	Casing Joint: Solvent welded/glued	Model Number: 75211G12BC	Pump Capacity: 12 GPM
Casing Fitting: None		Drop Pipe Length: 100.00 ft.	Pump Voltage:
		Drop Pipe Diameter: 1.00 in.	Drilling Record ID:
Diameter: 5.00 in. to 179.00 ft. depth SDR: 21.00		Draw Down Seal Used: No	
		Pressure Tank Installed: No	
Borehole: 8.75 in. to 178.00 ft. depth 4.50 in. to 356.00 ft. depth		Pressure Relief Valve Installed: No	

Static Water Level: 43.00 ft. Below Grade	Well Yield Test: 1.00 hrs. at 20 GPM	Yield Test Method: Air	Formation Description	Thickness	Depth to Bottom
			Sand & Clay Brown	19.00	19.00
Screen Installed: No Intake: Bedrock Well			Sand & Gravel	47.00	66.00
			Gray Clay Soft	12.00	78.00
			Gray Clay W/Gravel	39.00	117.00
			Shale	29.00	146.00
			Sandstone & Shale	35.00	181.00
			Sandstone	34.00	215.00
			Shale	126.00	341.00
			Sandstone	15.00	356.00

Well Grouted: Yes	Grouting Method: Grout pipe outside casing
Grouting Material: Bentonite slurry	Depth: 0.00 ft. to 175.00 ft.
Bags: 11.00	Additives: None
Geology Remarks:	

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: D Hein and W Witt
Type: Septic tank	Employment: Employee
Distance: 75 ft.	Pump Installer: C Fell and C Blackshear
Direction: West	Contractor Type: Water Well Drilling Contractor Reg No: 33-2036

Abandoned Well Plugged: Yes	Business Name: Hart Well Drilling
Drilling Record ID: 23000003765	Business Address: 1154 S Jefferson, Mason, MI, 48854

Casing Diameter: 4 in.	Casing Removed: No
Plugging Material: Neat cement	
No. of Bags: 18.00	Well Depth: 180 ft.
Water Well Contractor's Certification	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks: Plugged well GPS 42.67748 -84.63865 Original depth 360, probed to 180 and was solid at bottom. Well was pumping black mud, formation may have caved in. New well producing 20 GPM from 100 feet while developing with air.

Other Remarks:



Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

Tax No:	Permit No: 31521	County: Eaton		Township: Windsor	
Well ID: 23000011554		Town/Range: 03N 03W	Section: 3	Well Status: Active	WSSN:
		Source ID/Well No:			
Elevation:		Distance and Direction from Road Intersection:			
Latitude: 42.67995		3/8 MILE WEST OF LANSING RD ON NORTH SIDE OF WOODLANE DR. HOLIDAY INN EXPRESS			
Longitude: -84.652516		Well Owner: STARBEST CONSTRUCTION			
Method of Collection: GPS Std Positioning Svc SA Off		Well Address: 9490 WOODLANE DR DIAMONDALE, MI 48821		Owner Address: 1040 HAMLIN RD ROCHESTER HILLS, MI 48309	

Drilling Method: Rotary	Well Use: Irrigation	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 200.00 ft.	Date Completed: 9/13/2013	Pump Installation Date: 9/13/2013	HP: 0.50
Well Type: New	Height:	Manufacturer: A.Y. McDonald	Pump Type: Submersible
Casing Type: PVC plastic	Casing Joint: Solvent welded/glued	Model Number: 23150M2	Pump Capacity: 25 GPM
Casing Fitting:		Drop Pipe Length: 80.00 ft.	Pump Voltage: 230
		Drop Pipe Diameter: 1.25 in.	Drilling Record ID:
Diameter: 5.00 in. to 115.00 ft. depth SDR: 21.00		Draw Down Seal Used: No	
		Pressure Tank Installed: No	
Borehole: 8.75 in. to 115.00 ft. depth 4.50 in. to 200.00 ft. depth		Pressure Relief Valve Installed: No	

Static Water Level: 24.00 ft. Below Grade	Well Yield Test: Pumping level 80.00 ft. after 1.00 hrs. at 50 GPM	Yield Test Method: Air	Formation Description	Thickness	Depth to Bottom
			Brown Clay & Sand Soft	6.00	6.00
			Gray Clay	30.00	36.00
			Gravel & Clay Medium	9.00	45.00
			Gray Clay Hard	20.00	65.00
			Gray Clay & Sand Soft	15.00	80.00
			Gravel & Clay Fine W/Stones	21.00	101.00
			Sandstone Broken W/Sand	14.00	115.00
			Shale & Sandstone Water Bearing	85.00	200.00

Screen Installed: No	Intake: Bedrock Well	Geology Remarks:
Well Grouted: Yes	Grouting Method: Grout pipe inside casing	
Grouting Material: Bentonite slurry	Bags: 8.00	
	Additives: None	
	Depth: 0.00 ft. to 115.00 ft.	

Wellhead Completion: 12 inches above grade

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: RICK FREY
Type: Other	Employment: Employee
Distance: 75 ft.	
Direction: North	

Contractor Type: Water Well Drilling Contractor	Reg No: 13-1593
Business Name: Mike Katz Well Drilling	
Business Address: 1479 E Michigan, Battle Creek, MI, 49017	

Water Well Contractor's Certification	
This well/pump was constructed under my supervision and I hereby certify that the work complies with Part 127 Act 368 PA 1978 and the well code.	
Signature of Registered Contractor	Date

General Remarks:
Other Remarks: Contamination Source 1:MUNICIPAL SEWER

ATTACHMENT B

Test Pit and Soil Boring Documentation



PROJECT: LBWL - Erickson PAGE 1 OF 1
 PROJECT NO.: BORING CW-SB-01
 ELEVATION: DATE 10/2/2018
 FIELD GEOLOGIST: Tim Mayotte RIG Geoprobe

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION*			USCS OR ROCK BROKENNESS	REMARKS
				SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
1						Void		
2								
3	NA	2.5 ft	Dry	Stiff	Gray-Brown	Sandy Clay	CL	
4								
5								
6								
7	NA	4 ft	Wet	Loose	Gray-Brown	Fine to Medium Sand	SP	Boring consists
8								of layers of
9								saturated soils
10		4 ft	Dry	Loose		Medium Sand	SP	from a depth of
11								5 ft to EOB.
12								
13								
14		4 ft	Moist	Loose		Medium to Coarse Sand	SP	
15								
16			Wet	Stiff		Sandy Clay	SC-CL	
17						End of boring = 16 feet.		
18								
19								
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22								
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REMARKS Boring backfilled with bentonite chips.



PROJECT: LBWL - Erickson PAGE 1 OF 1
 PROJECT NO.: BORING CW-SB-02
 ELEVATION: DATE 10/2/2018
 FIELD GEOLOGIST: Tim Mayotte RIG Geoprobe

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION*			USCS OR ROCK BROKENNESS	REMARKS
				SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
1						Void		
2								
3	NA	3 ft	Dry	Stiff	Gray-Brown/	Clay	CL	
4					Black			
5								
6								
7	NA	4 ft	Wet	Loose	Gray-Brown	Medium Sand	SP	Boring consists
8								of layers of
9								saturated soils
10		4 ft	Moist	Loose	Gray-Brown	Medium Sand	SP	from a depth of
11								5 ft to EOB.
12								
13			Wet					
14		4 ft		Loose	Gray-Brown	Medium Sand	SP	
15			Moist					
16								
17						End of boring = 16 feet.		
18								
19								
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40								

REMARKS Boring backfilled with bentonite chips.



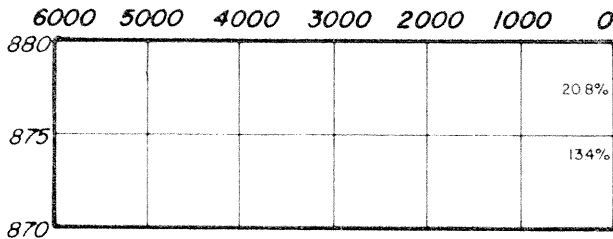
PROJECT: LBWL - Erickson PAGE 1 OF 1
 PROJECT NO.: BORING CW-SB-03
 ELEVATION: DATE 10/2/2018
 FIELD GEOLOGIST: Tim Mayotte RIG Geoprobe

SAMPLE NO., TYPE & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION*			USCS OR ROCK BROKENNESS	REMARKS
				SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
1			Dry			Void		
2								
3	NA	2.25 ft	Dry	Stiff	Gray-Brown	Clay	CL	
4								
5			Moist - Wet					
6								
7	NA	3 ft	Moist - Wet	Loose	Gray-Brown	Medium Sand	SP	Boring consists
8								of layers of
9			Wet					saturated soils
10		4 ft		Wet	Loose	Gray-Brown	Medium Sand	SP
11			Moist - Wet					5 ft to EOB.
12								
13			Moist - Wet					
14		4 ft		Moist - Wet	Loose	Gray-Brown	Medium Sand	SP
15								
16								
17						End of boring = 16 feet.		
18								
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40								

REMARKS Boring backfilled with bentonite chips.

ELEVATION IN FEET

SHEARING STRENGTH IN LBS./SQ.FT.



BULK SAMPLES
BAG SAMPLES

TEST PIT AP-1

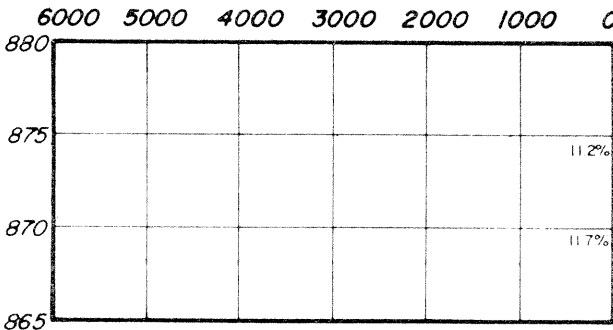
SURFACE ELEVATION 879.6

SYMBOLS	DESCRIPTIONS
ML	DARK BROWN CLAYEY SILT WITH ROOTS - TOPSOIL (9')
SC	MOTTLED BROWN AND GRAY CLAYEY FINE SAND WITH SOME SMALL GRAVEL. ROOTS TO 2'-6"
ML	BROWN FINE SANDY SILT WITH SOME SMALL GRAVEL AND TRACE OF CLAY. 3' POCKET OF WATER BEARING FINE SAND ON WEST WALL OF PIT AT 60'

TEST PIT COMPLETED AT 80'
ON 6/23/69
MINOR SEEPAGE WATER FROM POCKET OF SAND AT 60'

ELEVATION IN FEET

SHEARING STRENGTH IN LBS./SQ.FT.



BULK SAMPLES
BAG SAMPLES

TEST PIT AP-2

SURFACE ELEVATION 877.8

SYMBOLS	DESCRIPTIONS
ML	DARK BROWN CLAYEY SILT WITH ROOTS - TOPSOIL (10')
SC	MOTTLED BROWN AND GRAY CLAYEY SAND
SM	MOTTLED BROWN AND GRAY FINE SILTY SAND WITH SOME CLAY AND SMALL GRAVEL
ML	BROWN SILT. 2" SEAM OF BROWN FINE TO COARSE SAND WITH GRAVEL AT 5.5'
ML	GRAY CLAYEY SILT WITH SOME FINE SAND AND SMALL GRAVEL

TEST PIT COMPLETED AT 90'
ON 6/23/69
MINOR SEEPAGE WATER AT 5.5'

LOG OF TEST PITS

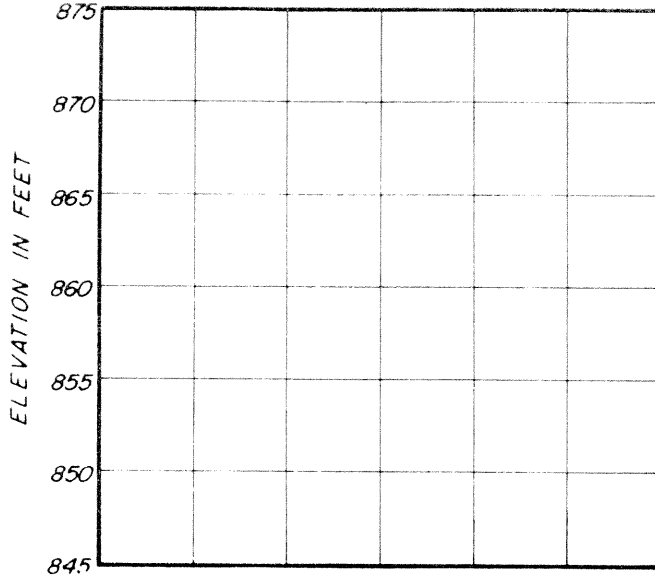
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SHEARING STRENGTH IN LBS./SQ.FT.
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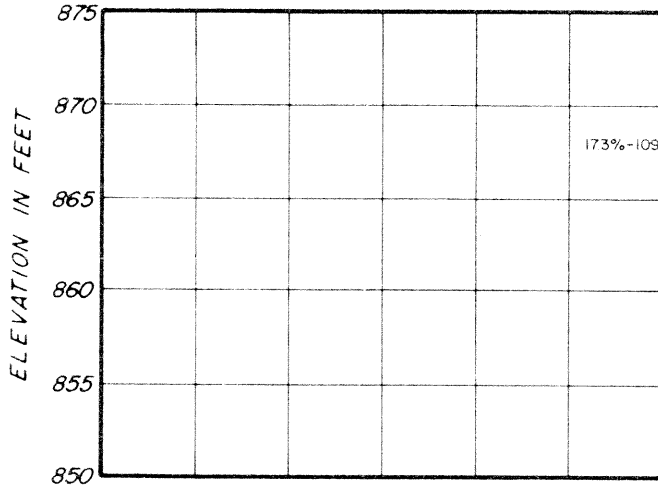
BLOW COUNTS
 SAMPLES

BORING AP-3
 SURFACE ELEVATION 872.8

SYMBOLS		DESCRIPTIONS
ML		BROWN SANDY SILT WITH ROOTS - TOPSOIL (6")
CL		BROWN SANDY CLAY WITH SOME ROOTS ROOTS GRADING OUT AT 2.5'
SC		BROWN CLAYEY SAND GRADING SOME SMALL GRAVEL
CL		BROWN SANDY CLAY WITH SOME SMALL GRAVEL
SP		BROWN FINE TO MEDIUM SAND SEEPAGE WATER ENCOUNTERED AT 7-8' WATER ROSE TO 5-10" IN 15 MINUTES
SP		GRAYISH - BROWN FINE SAND
ML		GRAY FINE SANDY SILT
SC		GRAY CLAYEY FINE SAND WITH SOME SMALL GRAVEL
SP		GRAY SILTY FINE SAND WITH SOME GRAVEL

BORING COMPLETED AT 25.0'
 ON 7/8/59
 CASING USED TO A DEPTH OF 14.0'
 WATER LEVEL NOT RECORDED

SHEARING STRENGTH IN LBS./SQ.FT.
 6000 5000 4000 3000 2000 1000 0



BLOW COUNTS
 SAMPLES

BORING AP-4
 SURFACE ELEVATION 870.7

SYMBOLS		DESCRIPTIONS
OL		BLACK ORGANIC SILT WITH ROOTS - TOPSOIL (12")
SC		GRAY CLAYEY SAND WITH ORGANIC MATTER SEEPAGE WATER ENCOUNTERED AT 2-6"
SC		MOTTLED BROWN AND GRAY CLAYEY SAND WITH POCKETS OF BROWN FINE SAND
ML		MOTTLED BROWN AND GRAY CLAYEY SILT WITH SOME SAND
ML		GRAY CLAYEY SILT WITH FINE SAND
ML		GRAY SILT
SW		GRAY FINE TO COARSE SAND WITH SOME SMALL GRAVEL
ML		GRAY SILT

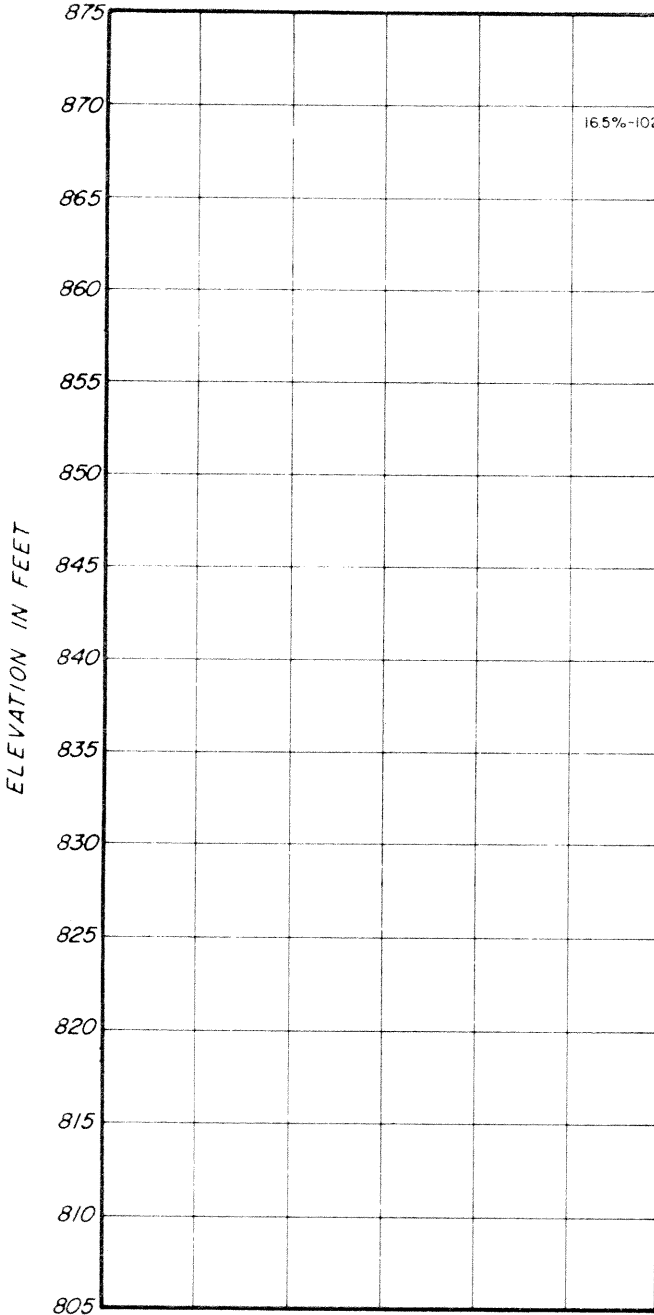
BORING COMPLETED AT 15.0'
 ON 7/11/59
 NO CASING USED
 WATER LEVEL NOT RECORDED

LOG OF BORINGS

BY _____ DATE _____
 BY _____ DATE _____
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 PLATE _____ OF _____

SHEARING STRENGTH IN LBS./SQ.FT.

6000 5000 4000 3000 2000 1000 0



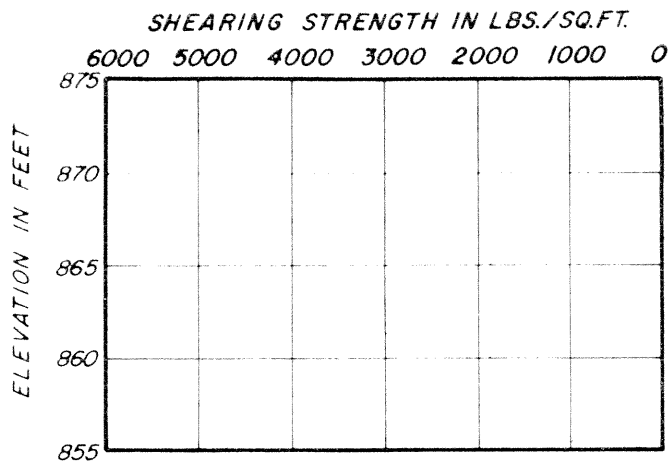
BORING AP-5

SURFACE ELEVATION 872.5

BLOW COUNTS SAMPLES	SYMBOLS	DESCRIPTIONS
	OL	BLACK ORGANIC CLAYEY SILT WITH SOME SAND AND ROOTS - TOPSOIL (15')
8	SP	BROWN FINE SAND
2		
7	SM	GRAY SILTY FINE SAND
5		GRAY FINE SAND
5	SP	
6		
6	ML	GRAY FINE SANDY SILT
		GRAY CLAYEY SAND WITH SOME SAND GRAVEL
10		
15	SC	
20		GRAY CLAYEY SILT WITH FINE SAND AND SOME SMALL GRAVEL
24	ML	OCCASIONAL SEAMS OF FINE SAND
		ALTERNATING LAYERS OF GRAY FINE SAND AND GRAY SILTY SAND
27	SP SM	
		GRAY SILTY SAND WITH TRACE OF CLAY AND SOME SMALL GRAVEL
18	SM	
47		
25		GRAY SANDY SILT WITH SOME SMALL GRAVEL
16	ML	
R		GRAY SANDSTONE

BORING COMPLETED AT 62.7'
 ON 7/9/69
 CASING USED TO A DEPTH OF 29.0'
 WATER LEVEL NOT RECORDED

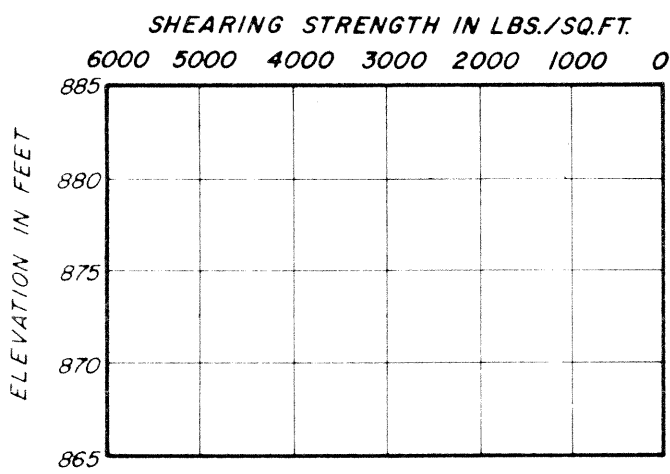
LOG OF BORINGS



BORING AP-6
SURFACE ELEVATION 872.6

SYMBOLS		DESCRIPTIONS
3	CL	BLACK ORGANIC CLAYEY SILT WITH ROOTS - TOPSOIL (9") MOTTLED BROWN AND GRAY SANDY CLAY WITH SOME ROOTS
2	ML	ROOTS GRADING OUT SEEPAGE WATER ENCOUNTERED AT 3'-6" GRAY CLAYEY SILT WITH ORGANIC MATTER
4	ML	GRAY FINE SANDY SILT
6	ML	
11	SC	GRAY CLAYEY FINE SAND WITH SOME SMALL GRAVEL

BORING COMPLETED AT 150'
ON 7/9/69
NO CASING USED
WATER LEVEL NOT RECORDED



BORING AP-7
SURFACE ELEVATION 882.6

SYMBOLS		DESCRIPTIONS
4	ML	DARK BROWN CLAYEY SILT WITH ROOTS - TOPSOIL (9") MOTTLED BROWN AND GRAY SANDY CLAY
11	SM	SEEPAGE WATER ENCOUNTERED AT 3'-1" MOTTLED BROWN AND GRAY SILTY SAND WITH TRACE OF CLAY
19	SP	BROWN FINE TO MEDIUM SAND
13	CL	GRAY SANDY CLAY WITH SOME SMALL GRAVEL
9	ML	GRAY CLAYEY SILT WITH FINE SAND

BORING COMPLETED AT 150'
ON 7/11/69
NO CASING USED
WATER LEVEL NOT RECORDED


LOG OF BORINGS

BY _____ DATE _____
 BY _____ DATE _____
 CHECKED BY _____ DATE _____
 CHECKED BY _____ DATE _____

PHOTOGRAPHIC LOG

Customer: LBWL	Project No.: LBWL-1018-001
Site Name: 3725 South Canal Road	Site Location: Delta Township, Michigan
Photographer: Tim Mayotte	
Photo No.: 1	
Date: June 2014	
Direction: East	
Notes: Two test pits excavated within footprint of Retention Basin. Note standing water.	
Photographer: Tim Mayotte	
Photo No.: 2	
Date: June 2014	
Direction: NA	
Notes: View into test pit within footprint of Forebay. Soils are sandy clays and clayey sands. Soil conditions are dry despite surface moisture.	

PHOTOGRAPHIC LOG

Customer: Allen-Bailey Tag & Label	Project No.: ABT-0318-001
Site Name: 3177 Lehigh Street	Site Location: Caledonia, NY 14423
Photographer: Tim Mayotte	
Photo No.: 3	
Date: April 6, 2018	
Direction: NA	
Notes: View into test pit within footprint of Forebay. Soils are sandy clays and clayey sands. Soil conditions are dry despite surface moisture.	
Photographer: Tim Mayotte	
Photo No.: 4	
Date: April 6, 2018	
Direction: NA	
Notes: View into test pit within footprint of Retention Basin. Soils are sandy clays and clayey sands. Soil conditions are dry despite surface moisture.	

PHOTOGRAPHIC LOG

Customer: Allen-Bailey Tag & Label	Project No.: ABT-0318-001
Site Name: 3177 Lehigh Street	Site Location: Caledonia, NY 14423
Photographer: Tim Mayotte	
Photo No.: 5	
Date: April 6, 2018	
Direction: NA	
Notes: View into test pit within footprint of Retention Basin. Soils are sandy clays and clayey sands. Soil conditions are dry despite surface moisture.	
Photographer: Tim Mayotte	
Photo No.: 6	
Date: April 6, 2018	
Direction: South	
Notes: View into test pit within footprint of Retention Basin. Soils are sandy clays and clayey sands. Soil conditions are dry despite surface moisture.	

GEOTECHNICAL TESTING SUMMARY

LBWL - Erickson Station - Foundation Samples

MD&E Project No.



SAMPLE	CLASSIFICATION	%Fines	LL%	PI%	w ^o / _{field}	w ^o / _{opt}	ρ _d (lbs/ft ³)	K (cm/s)
EW-F-01	Clayey Sand	29.50	NA	NA	NA	9.20	124.24	NA
EW-F-02	Clayey Sand	14.10	NA	NA	NA	8.25	129.23	NA
EW-F-03	Clayey Sand	9.70	NA	NA	NA	12.00	121.11	NA
EW-F-04	Clayey Sand	9.80	NA	NA	NA	8.50	125.92	NA
EW-F-05	Clayey Sand	16.30	NA	NA	NA	8.30	126.86	NA
EW-F-06	Clayey Sand	12.20	NA	NA	NA	7.85	131.10	NA
EW-T-01	Clayey Sand	NA	NA	NA	NA	10.00	133.60	NA
EW-T-02	Clayey Sand	NA	NA	NA	NA	9.80	127.67	NA
EW-T-03	Clayey Sand	NA	NA	NA	NA	9.30	127.98	NA
West Floor	Clayey Sand	13.10	NA	NA	NA	9.00	128.61	NA
South Floor	Clayey Sand	17.60	NA	NA	NA	7.95	129.98	NA
Ranges/Averages:								

NOTES:

GRAIN SIZE ANALYSIS

Sieve Analysis

Project: LBWL - Erickson Ash Impoundment Reconfiguration
 Sample: E. Floor Cut Stockpile
 Test Date: 7/8/2014
 Test Personnel: TJM
 Visual Classification: Clayey sand



Wt. of Soil Container (g): 31.50
 W. of Container w/Dry Soil (g): 700.00
 Wt. of Dry Soil (g): 668.50

Sieve Number	Diameter (mm)	Mass of Sieve (g)	Mass of Sieve/Soil (g)	Soil Retained (g)	Percent Retained	Percent Passing
4	4.750	419.50	435.50	16.0	2.4%	97.6%
10	2.000	391.00	431.50	40.5	6.1%	91.5%
20	0.840	322.00	364.50	42.5	6.4%	85.2%
40	0.425	284.50	326.00	41.5	6.2%	79.0%
60	0.250	264.50	331.50	67.0	10.0%	69.0%
100	0.150	258.00	383.50	125.5	18.8%	50.2%
200	0.075	244.50	382.50	138.0	20.6%	29.5%
Pan	---	366.50	561.50	195.0	29.2%	0.4%
				666.0		

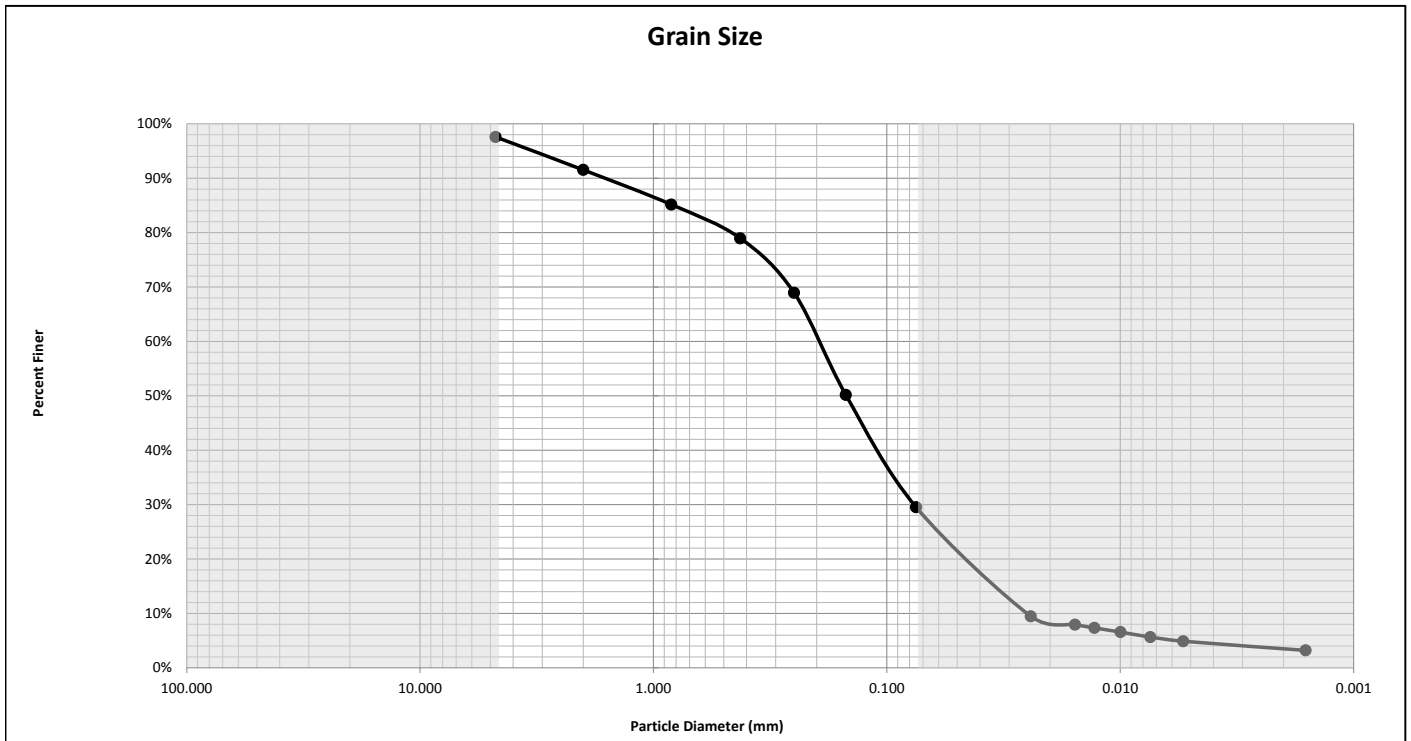
% Gravel: 2.4% D₁₀: 0.025 mm
 % Sand: 68.1% D₃₀: 0.075 mm
 % Fines: 29.2% D₆₀: 0.2 mm

C_u: 8
 C_c: 1 Well Graded

Hydrometer Analysis

Test Date: 8-Jul-14
 Hydrometer Number: 152H
 Specific Gravity of Soil: 2.55
 Dispersing Agent: SHMP
 Weight of Soil Sample (g): 194.5
 Zero Correction: 6
 Meniscus Correction: 1

Date	Time	Elapsed Time (min)	Temp °C	Hydrom. Reading	Corrected Hydrom. Reading	L	k	D (mm)	C _r	a	R _c	P	P _A
		0	24	75	76	6.5	0.01342	---	1	1.02	---	---	---
		2	24	67	68	6.5	0.01342	0.02419	1	1.02	62	32.5	9.5%
		5	24	57	58	6.8	0.01342	0.01565	1	1.02	52	27.3	8.0%
		8	24	53	54	7.4	0.01342	0.01291	1	1.02	48	25.2	7.3%
		15	24	48	49	8.3	0.01342	0.00998	1	1.02	43	22.6	6.6%
		30	24	42	43	9.2	0.01342	0.00743	1	1.02	37	19.4	5.7%
		63	24	37	38	10.1	0.01342	0.00537	1	1.02	32	16.8	4.9%
		836	24	26	27	12	0.01342	0.00161	1	1.02	21	11.0	3.2%



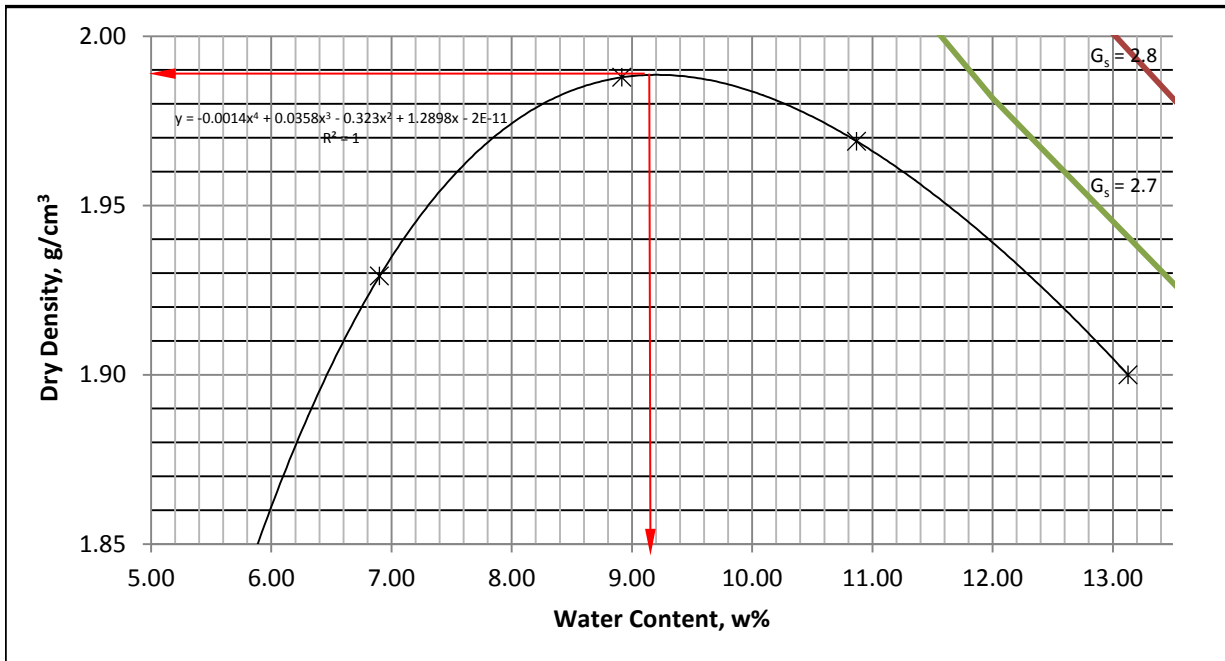
Unified Classification of Sample: Silty Clay or Clayey Sand

MOISTURE-DENSITY (Compaction) TEST



Test Method: Standard Proctor (Method A) ASTM 698
 Test Date: 8-Jul-14
 Test Personnel: T. Mayotte
 Project: LBWL - Erickson
 Sample: EW-F-01
 Visual Classification of Soil: SC-SM

Test No.	1	2	3	4	5	6
w% (assumed)	7.00	9.00	11.00	13.00		
WC Tin No.	4B	3B	1F	1Y		
M _c (g)	13.91	13.79	13.86	14.23		
M _{cms} (g)	77.27	101.85	104.24	107.13		
M _{cds} (g)	73.18	94.64	95.38	96.35		
M _s (g)	59.27	80.85	81.52	82.12	0.00	0.00
M _w (g)	4.09	7.21	8.86	10.78	0.00	0.00
w%	6.90	8.92	10.87	13.13	#DIV/0!	#DIV/0!
Mold No.	B	B	B	B		
Mold Vol (cm ³)	952.61	952.61	952.61	952.61		
M _{mold} (g)	2282.00	2282.00	2282.00	2282.00		
M _m + M _{cs} (g)	4246.50	4344.50	4361.50	4329.50		
M _{mms} (g)	1964.50	2062.50	2079.50	2047.50	0.00	0.00
ρ _{ws} (g/cm ³)	2.06	2.17	2.18	2.15	#DIV/0!	#DIV/0!
ρ _d (g/cm ³)	1.93	1.99	1.97	1.90	#DIV/0!	#DIV/0!



Optimum Moisture Content: 9.2 %

Maximum Dry Density: 1.99 g/cm³ 124.24 lbs/ft³

GRAIN SIZE ANALYSIS

Sieve Analysis

Project: LBWL - Erickson Ash Impoundment Reconfiguration
 Sample: EW-F-01
 Test Date: 7/8/2014
 Test Personnel: TJM
 Visual Classification: Clayey sand



Wt. of Soil Container (g): 31.00
 W. of Container w/Dry Soil (g): 644.50
 Wt. of Dry Soil (g): 613.50

Sieve Number	Diameter (mm)	Mass of Sieve (g)	Mass of Sieve/Soil (g)	Soil Retained (g)	Percent Retained	Percent Passing
4	4.750	419.50	482.00	62.5	10.2%	89.8%
10	2.000	391.00	515.00	124.0	20.2%	69.6%
20	0.840	322.00	419.50	97.5	15.9%	53.7%
40	0.425	284.50	341.50	57.0	9.3%	44.4%
60	0.250	264.50	322.50	58.0	9.5%	35.0%
100	0.150	258.00	323.00	65.0	10.6%	24.4%
200	0.075	244.50	307.50	63.0	10.3%	14.1%
Pan	---	366.50	451.50	85.0	13.9%	0.2%
				612.0		

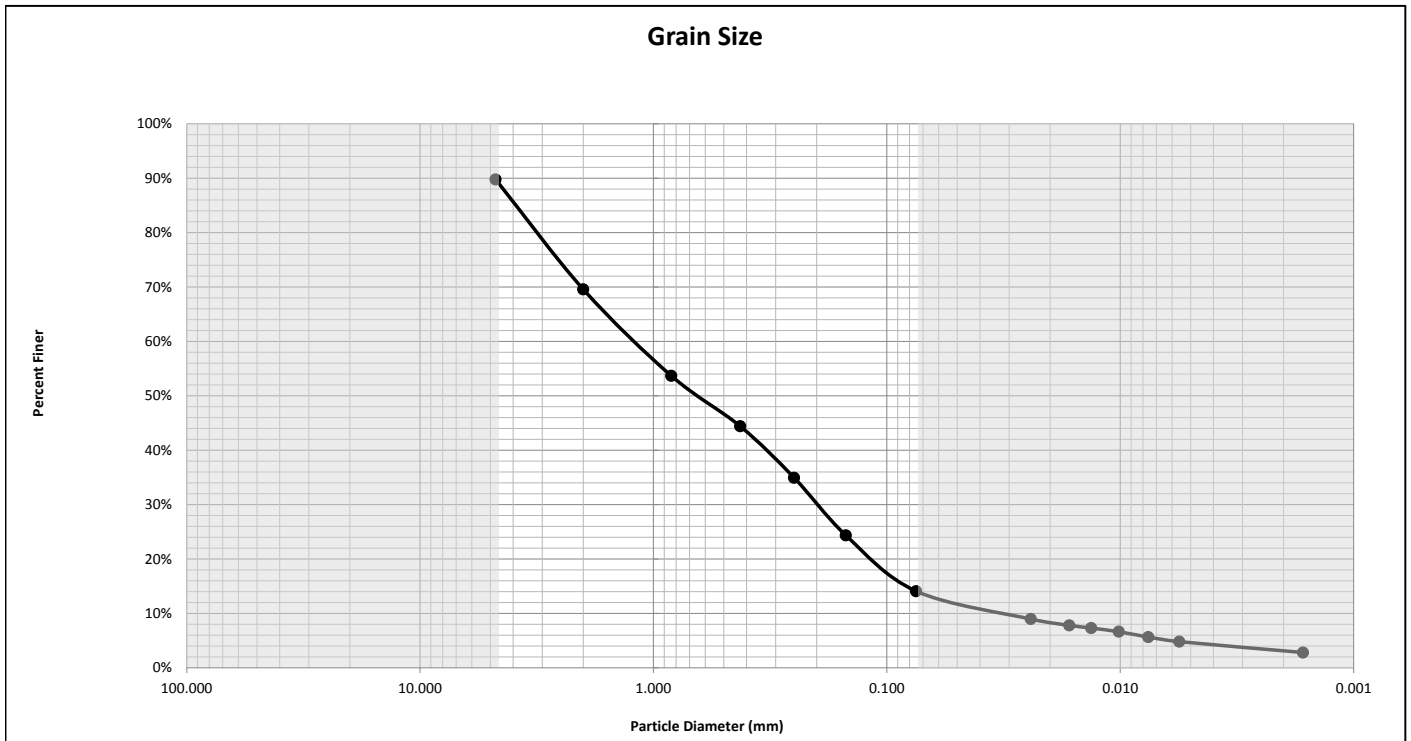
% Gravel: 10.2% D₁₀: 0.03 mm
 % Sand: 75.7% D₃₀: 0.2 mm
 % Fines: 13.9% D₆₀: 1.2 mm

C_u: 40
 C_c: 1 Well Graded

Hydrometer Analysis

Test Date: 8-Jul-14
 Hydrometer Number: 152H
 Specific Gravity of Soil: 2.55
 Dispersing Agent: SHMP
 Weight of Soil Sample (g): 85
 Zero Correction: 7
 Meniscus Correction: 0

Date	Time	Elapsed Time (min)	Temp °C	Hydrom. Reading	Corrected Hydrom. Reading	L	k	D (mm)	C _r	a	R _c	P	P _A
		0	24	70	70	6.5	0.01342	---	1	1.02	---	---	---
		2	24	60	60	6.5	0.01342	0.02419	1	1.02	54	64.8	9.0%
		5	24	53	53	7.6	0.01342	0.01655	1	1.02	47	56.4	7.8%
		8	24	50	50	7.9	0.01342	0.01334	1	1.02	44	52.8	7.3%
		15	24	46	46	8.6	0.01342	0.01016	1	1.02	40	48.0	6.7%
		30	24	40	40	9.6	0.01342	0.00759	1	1.02	34	40.8	5.7%
		60	24	35	35	10.4	0.01342	0.00559	1	1.02	29	34.8	4.8%
		827	24	23	23	12.5	0.01342	0.00165	1	1.02	17	20.4	2.8%



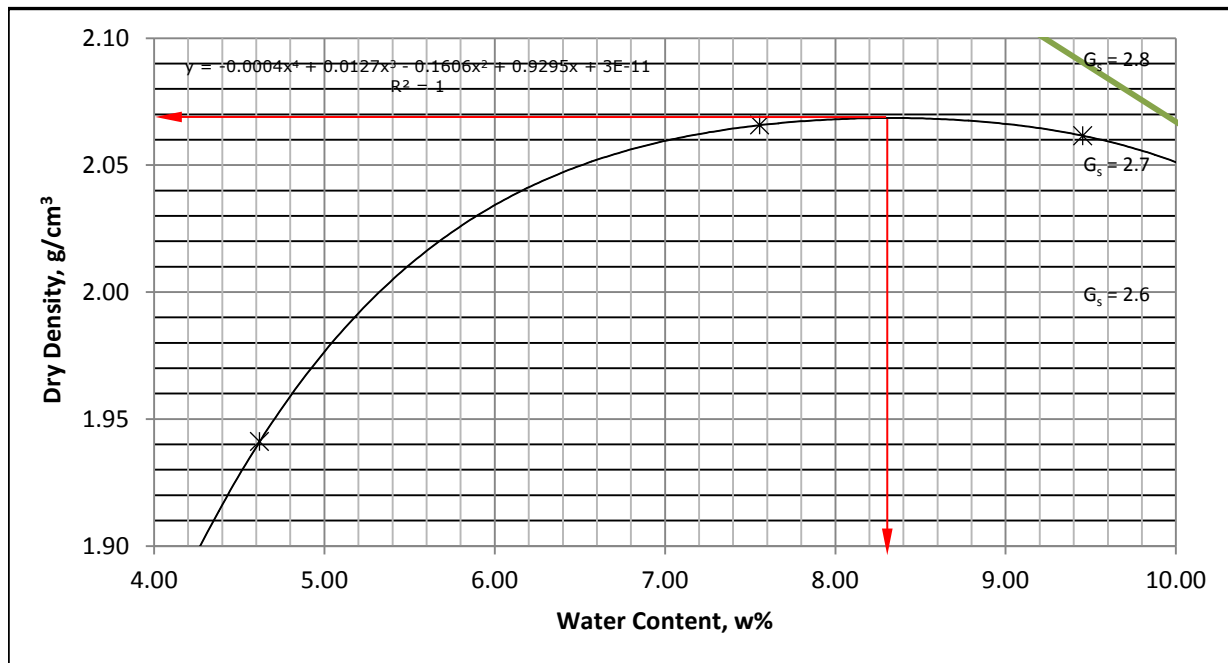
Unified Classification of Sample: Silty Clay or Clayey Sand

MOISTURE-DENSITY (Compaction) TEST



Test Method: Standard Proctor (Method A) ASTM 698
 Test Date: 8-Jun-14
 Test Personnel: T. Mayotte
 Project: LBWL - Erickson
 Sample: EW-F-02
 Visual Classification of Soil: SC-SM

Test No.	1	2	3	4	5	6
w% (assumed)	4.00	6.00	8.00	10.00		
WC Tin No.	3O	2C	1T	2D		
M _c (g)	14.10	14.09	13.76	13.96		
M _{cms} (g)	98.80	98.36	93.89	109.27		
M _{cds} (g)	95.06	92.44	86.97	99.52		
M _s (g)	80.96	78.35	73.21	85.56	0.00	0.00
M _w (g)	3.74	5.92	6.92	9.75	0.00	0.00
w%	4.62	7.56	9.45	11.40	#DIV/0!	#DIV/0!
Mold No.	A	A	A	A		
Mold Vol (cm ³)	952.61	952.61	952.61	952.61		
M _{mold} (g)	2287.00	2287.00	2287.00	2287.00		
M _m + M _{cs} (g)	4221.50	4403.50	4436.50	4391.50		
M _{mms} (g)	1934.50	2116.50	2149.50	2104.50	0.00	0.00
ρ _{ws} (g/cm ³)	2.03	2.22	2.26	2.21	#DIV/0!	#DIV/0!
ρ _d (g/cm ³)	1.94	2.07	2.06	1.98	#DIV/0!	#DIV/0!



Optimum Moisture Content: **8.25 %**

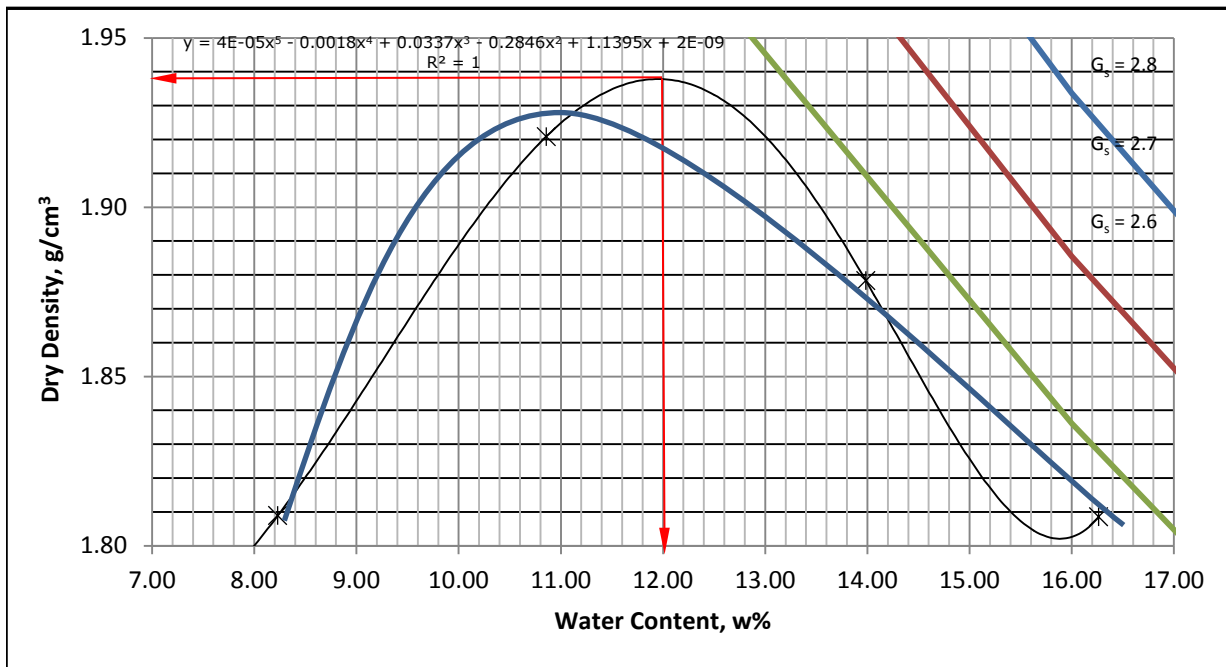
Maximum Dry Density: **2.07 g/cm³** **129.23 lbs/ft³**

MOISTURE-DENSITY (Compaction) TEST

Test Method: Standard Proctor (Method A) ASTM 698
 Test Date: 10-Jun-14
 Test Personnel: TJM
 Project:
 Sample: EW-F-03
 Visual Classification of Soil:



Test No.	1	2	3	4	5	6
w% (assumed)	4.00	7.00	10.00	13.00	15.00	
WC Tin No.	1F	2C	3I	4B	2A	
M _c (g)	13.87	14.08	13.76	13.91	13.84	
M _{cms} (g)	99.70	97.85	86.56	90.44	94.33	
M _{cds} (g)	95.52	91.48	79.43	81.05	83.07	
M _s (g)	81.65	77.40	65.67	67.14	69.23	0.00
M _w (g)	4.18	6.37	7.13	9.39	11.26	0.00
w%	5.12	8.23	10.86	13.99	16.26	#DIV/0!
Mold No.	B	B	B	B	B	
Mold Vol (cm ³)	952.61	952.61	952.61	952.61	952.61	
M _{mold} (g)	2282.00	2282.00	2282.00	2282.00	2282.00	
M _m + M _{cs} (g)	4037.00	4147.00	4310.50	4321.50	4285.00	
M _{mms} (g)	1755.00	1865.00	2028.50	2039.50	2003.00	0.00
ρ _{ws} (g/cm ³)	1.84	1.96	2.13	2.14	2.10	#DIV/0!
ρ _d (g/cm ³)	1.75	1.81	1.92	1.88	1.81	#DIV/0!



Optimum Moisture Content: **12 %**

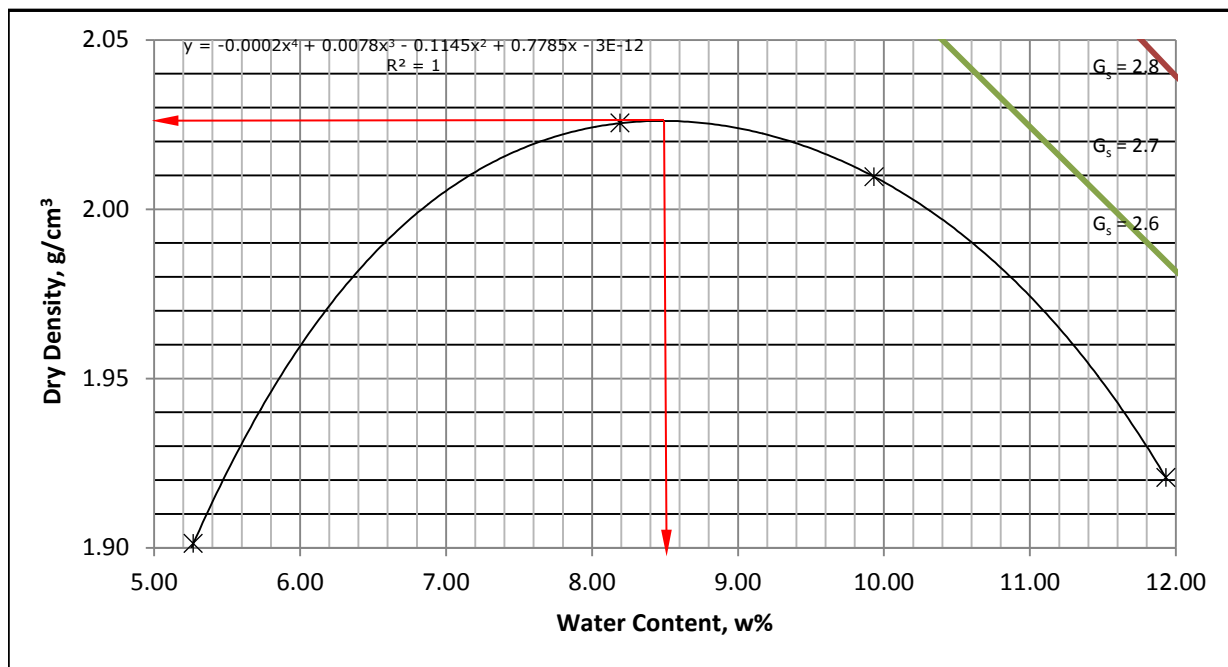
Maximum Dry Density: **1.94 g/cm³** **121.11 lbs/ft³**

MOISTURE-DENSITY (Compaction) TEST

Test Method: Standard Proctor (Method A) ASTM 698
 Test Date: 11-Jul-14
 Test Personnel: TJM
 Project:
 Sample: EW-F-04
 Visual Classification of Soil: Fine Sand



Test No.	1	2	3	4	5	6
w% (assumed)	4.00	7.00	10.00	13.00	15.00	
WC Tin No.	2D	3P	3N	3K		
M _c (g)	13.95	13.86	14.14	14.00		
M _{cms} (g)	101.07	107.88	119.07	109.97		
M _{cds} (g)	96.71	100.76	109.59	99.74		
M _s (g)	82.76	86.90	95.45	85.74	0.00	0.00
M _w (g)	4.36	7.12	9.48	10.23	0.00	0.00
w%	5.27	8.19	9.93	11.93	#DIV/0!	#DIV/0!
Mold No.	A	A	A	A		
Mold Vol (cm ³)	952.61	952.61	952.61	952.61		
M _{mold} (g)	2287.00	2287.00	2287.00	2287.00		
M _m + M _{cs} (g)	4193.50	4374.50	4391.50	4335.00		
M _{mms} (g)	1906.50	2087.50	2104.50	2048.00	0.00	0.00
ρ _{ws} (g/cm ³)	2.00	2.19	2.21	2.15	#DIV/0!	#DIV/0!
ρ _d (g/cm ³)	1.90	2.03	2.01	1.92	#DIV/0!	#DIV/0!



Optimum Moisture Content: **8.5 %**

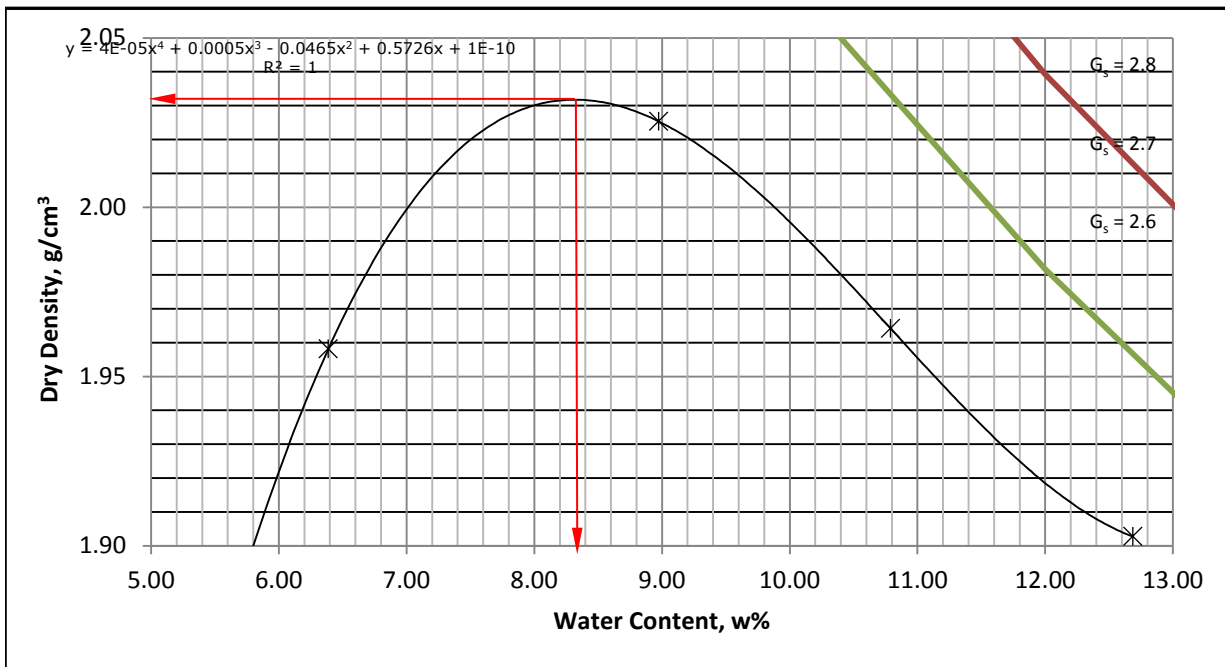
Maximum Dry Density: **2.017 g/cm³** **125.92 lbs/ft³**

MOISTURE-DENSITY (Compaction) TEST

Test Method: Standard Proctor (Method A) ASTM 698
 Test Date: 13-Jul-14
 Test Personnel: TJM
 Project:
 Sample: EW-F-05
 Visual Classification of Soil: Fine Sand



Test No.	1	2	3	4	5	6
w% (assumed)	4.00	7.00	9.00	11.00		
WC Tin No.	3L	2D	3A	3D		
M _c (g)	14.03	13.96	13.97	13.94		
M _{cms} (g)	110.79	96.40	106.70	111.65		
M _{cds} (g)	104.98	89.61	97.67	100.65		
M _s (g)	90.95	75.65	83.70	86.71	0.00	0.00
M _w (g)	5.81	6.79	9.03	11.00	0.00	0.00
w%	6.39	8.98	10.79	12.69	#DIV/0!	#DIV/0!
Mold No.	A	A	A	A		
Mold Vol (cm ³)	952.61	952.61	952.61	952.61		
M _{mold} (g)	2287.00	2287.00	2287.00	2287.00		
M _m + M _{cs} (g)	4271.50	4389.50	4360.00	4329.50		
M _{mms} (g)	1984.50	2102.50	2073.00	2042.50	0.00	0.00
ρ _{ws} (g/cm ³)	2.08	2.21	2.18	2.14	#DIV/0!	#DIV/0!
ρ _d (g/cm ³)	1.96	2.03	1.96	1.90	#DIV/0!	#DIV/0!



Optimum Moisture Content: **8.3 %**

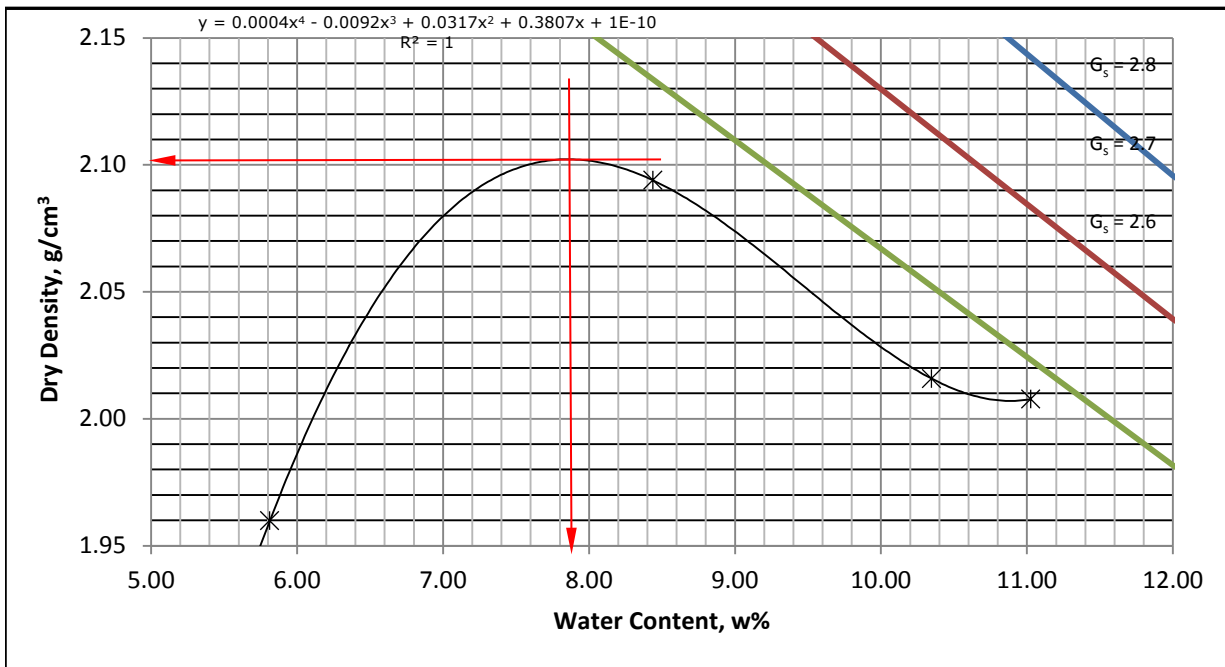
Maximum Dry Density: **2.032 g/cm³** **126.86 lbs/ft³**

MOISTURE-DENSITY (Compaction) TEST



Test Method: Standard Proctor (Method A) ASTM 698
 Test Date: 11-Jul-14
 Test Personnel: TJM
 Project:
 Sample: EW-F-06
 Visual Classification of Soil:

Test No.	1	2	3	4	5	6
w% (assumed)	4.00	7.00	10.00	13.00	15.00	
WC Tin No.	3D	3G	3A	3M		
M _c (g)	13.94	14.04	13.97	13.95		
M _{cms} (g)	95.48	106.17	99.41	104.27		
M _{cds} (g)	91.00	99.00	91.40	95.30		
M _s (g)	77.06	84.96	77.43	81.35	0.00	0.00
M _w (g)	4.48	7.17	8.01	8.97	0.00	0.00
w%	5.81	8.44	10.34	11.03	#DIV/0!	#DIV/0!
Mold No.	A	A	A	A		
Mold Vol (cm ³)	952.61	952.61	952.61	952.61		
M _{mold} (g)	2287.00	2287.00	2287.00	2287.00		
M _m + M _{cs} (g)	4262.50	4450.00	4406.00	4410.50		
M _{mms} (g)	1975.50	2163.00	2119.00	2123.50	0.00	0.00
ρ _{ws} (g/cm ³)	2.07	2.27	2.22	2.23	#DIV/0!	#DIV/0!
ρ _d (g/cm ³)	1.96	2.09	2.02	2.01	#DIV/0!	#DIV/0!



Optimum Moisture Content: **7.85 %**

Maximum Dry Density: **2.1 g/cm³** **131.10 lbs/ft³**