MINING AND RECLAMATION PROPOSAL

BURROUGHS MATERIALS CORPORATION

SPRINGFIELD TOWNSHIP SITE

PLANNING COMMISSION PRESENTATION

MAY 27, 2025

SMITHGROUP

GEOLOGY OF SOUTHEAST MICHIGAN

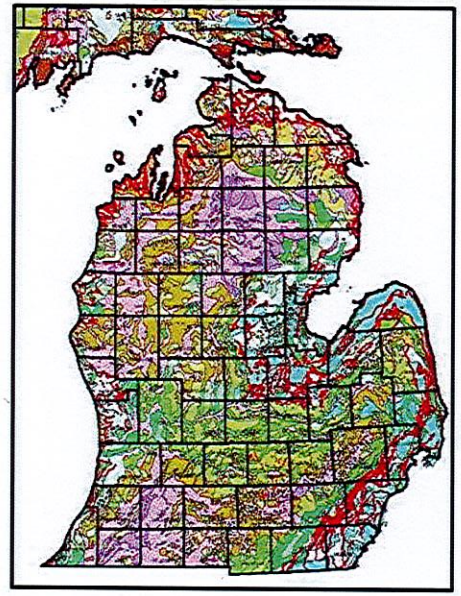
SMITHGROUP

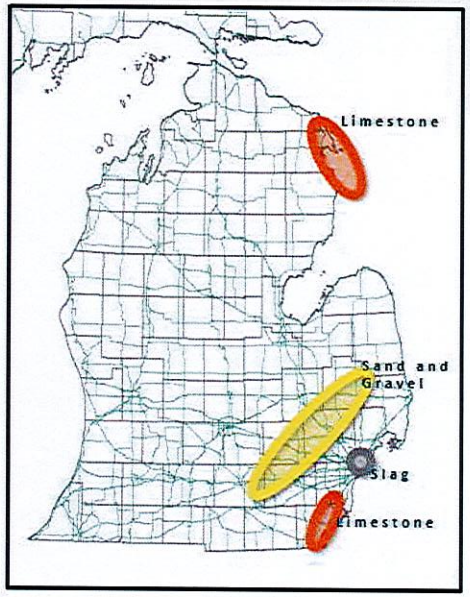
GEOLOGY OF SOUTHEAST MICHIGAN

WHERE IS SAND AND GRAVEL FOUND?

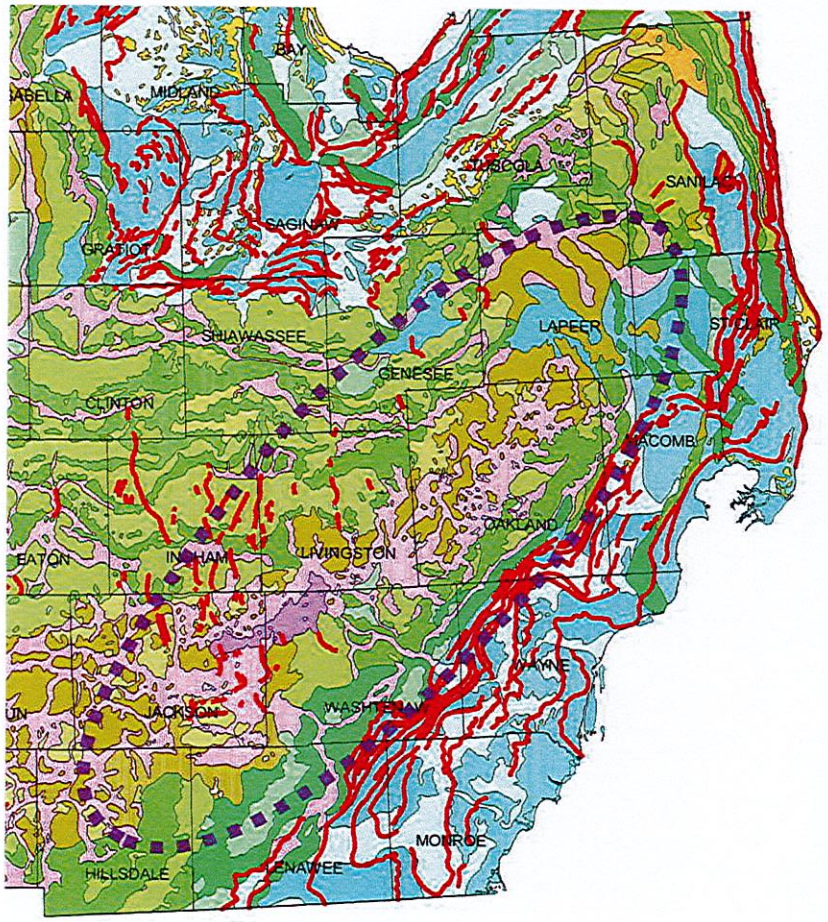
Marketable sand and gravel is typically found in coarse textured end moraines and associated outwash areas

"Even if sources of (sand and gravel) aggregate are present, they must meet certain quality parameters before they can be put to use" (Langer 2002)



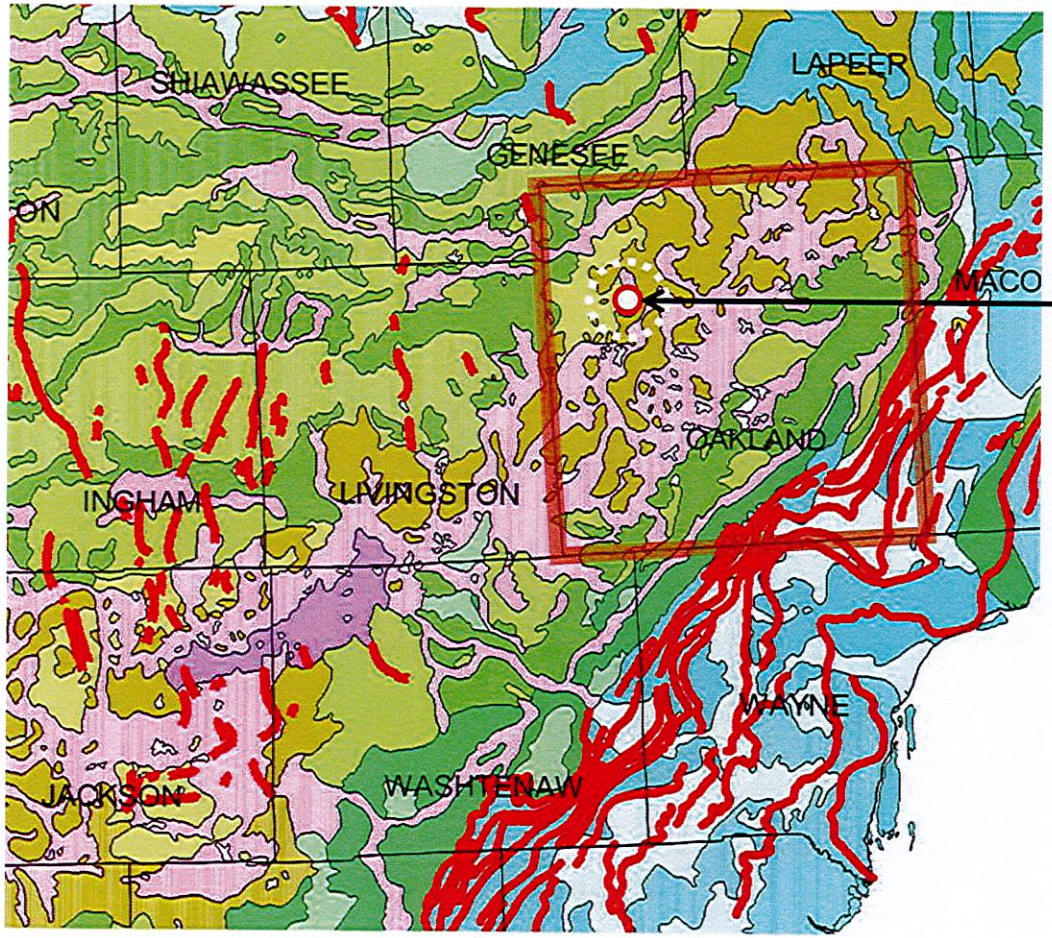


GEOLOGY OF SOUTHEAST MICHIGAN



- Peat and muck
- Postglacial alluvium
- Dune sand
- Lacustrine clay and silt
- Lacustrine sand and gravel
- Glacial outwash sand and gravel and postglacial alluvium
- Ice-contact outwash sand and gravel
- Fine-textured glacial till
- End moraines of fine-textured till
- Medium-textured glacial till
- End moraines of medium-textured till
- Coarse-textured glacial till
- End moraines of coarse-textured till
- Thin to discontinuous glacial till over bedrock
- Artificial fill
- Exposed bedrock surfaces
- Water
- Drumlins
- Eskers
- Shorelines
- Sinkholes
- Striations/Grooves

PROPOSED MINING SITE

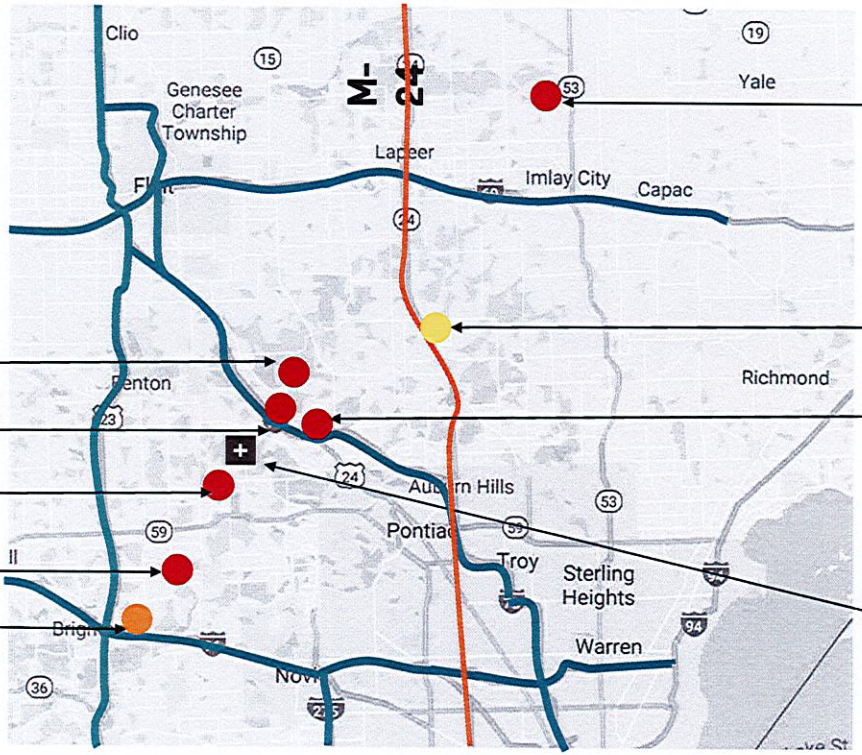


SPRINGFIELD TOWNSHIP
(Field Site)

STATUS OF EXISTING BMC / AFFILIATED OPERATIONS

Remaining Life

- 1 – 5 Years
- 6-10 Years
- 11-15 Years



Deanville Road

Oxford Ray Road

Grange Hall Road

SITE LOCATION

Groveland

Holly Sand and Gravel

Highland

Hartland

Buno Road

Note: Based on current market, permits, and equipment.

SAND AND GRAVEL PRODUCTS

Typical Products

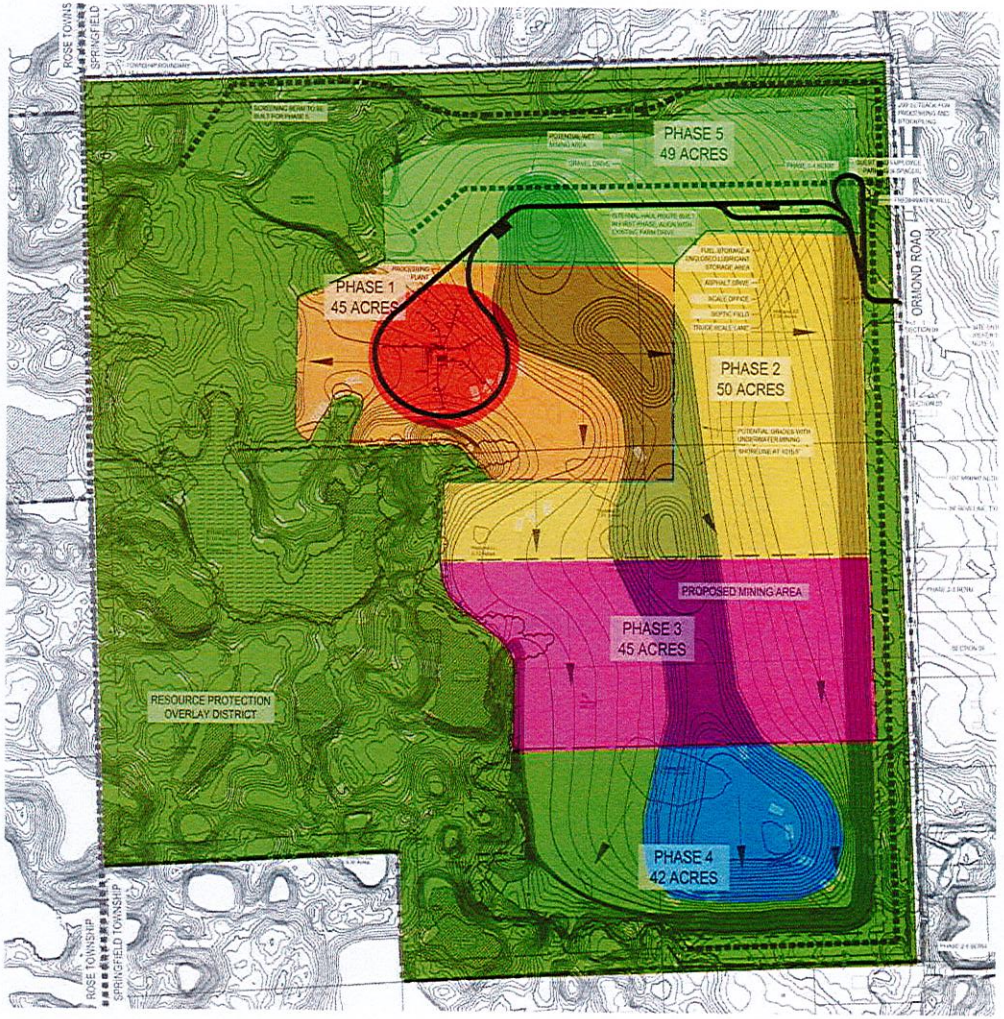
- 2NS Concrete Sand
- 6A and 6AC stone
- Pea stone
- Road Gravel
- Asphalt Gravel
- Fill Sand

2NS Concrete Sand is the majority of the product sold by volume

PROPOSED SPECIAL LAND USE

BURROUGHS MATERIALS CORPORATION

- Mine 238 acres of a 422-acre site in five phases over a 20-year period, subject to market and site conditions
- Mine and Reclaim the site in a logical sequence
- Shape the site for productive re-use, post mining



PLANNING PROCESS AND THE PROPOSED OPERATION

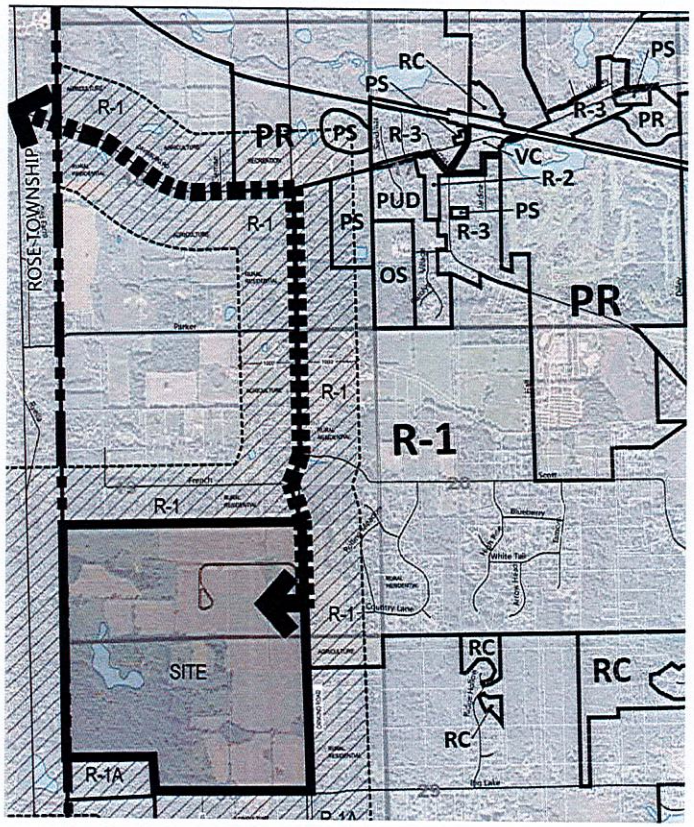
SMITHGROUP

UNDERSTAND THE SITE AND COMMUNITY

STEP ONE: UNDERSTANDING THE SITE AND GEOLOGY

INITIAL INVESTIGATIONS

- Natural Features Inventory and field verifying wetlands and Natural Features Overlay boundary
- Hydrogeological Assessment investigating groundwater conditions
- Traffic Impact Assessment and determining best haul route
- Assessment of local master plan, land uses, and ordinances



Proposed Haul Route: Ormond Road north to Davisburg Road west

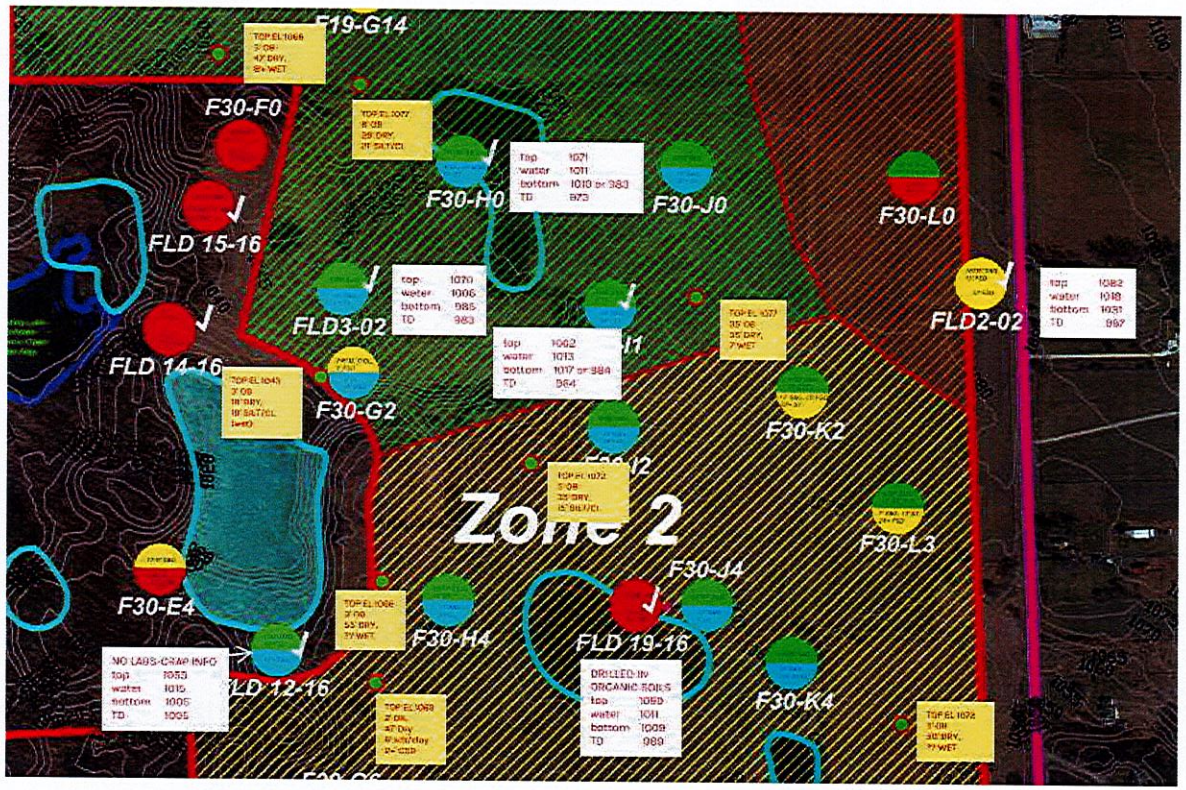
UNDERSTAND THE GEOLOGY

STEP ONE: UNDERSTANDING THE SITE AND GEOLOGY

INITIAL INVESTIGATIONS

Included 57 borings and 25 wells at Springfield, looking at-

- Quality of Sand and Gravel
- Depth and gradient of water table
- Thickness of overburden relative to reserves
- Base of reserves relative to water table



UNDERSTAND THE GEOLOGY

Drilling Co.	ECL	Property	Field	Hole #	F19-G13		
Date	4/4/2001	Parcel	F19	Sheet 1	Of	2	
Start Time	2:00 PM	Hole Location	Northern portion	Surface Elev.	1073'		
Finish Time	10:15 AM 4/5/2001	Logged By	Tim Higbee	Water Depth	61.5'		
Total Depth	97'	Drill Method	Auger				

Comments:

Graphical log Depth	Litho.	Description	From (feet)	To (feet)	Interval Thickness	Sample Interval	Lab Analysis LBW	FM	%Gr.	Note
2		Yellowish brown silty and sandy firm clay with abundant gravel.	Zero	2	2					
4		Yellow medium to coarse sand with 45% gravel. Maximum size 3", avg. 1/2".	2	17	15	2 to 17	5.5	2.34	47.3	S&G
6										
8										
10										
12										
14										
16										
18		Brown coarse sand with 40% gravel. Maximum size 2", avg. 1/2".	17	27	10	17 to 27	5.1	2.67	38.1	S&G
20										
22										
24										
26										
28		Yellow fine sand with 10% fine gravel.	27	29	2	27 to 29	5.6	1.79	11	FSD
30		Yellow medium to coarse sand with 40% gravel. Maximum size 1.5", avg. 1/4".	29	34	5	29 to 34	5.7	2.7	44	S&G
32										
34										
36		Light yellow very fine sand to silt with 15% fine gravel.	34	37	3	34 to 37	7.1	1.34	17	ST
38		Brown medium sand with 20% fine gravel.	37	42.5	5.5	37 to 42.5	5.9	2.35	28.2	S&G
40										
42										
44		Light yellow fine sand with some thin bands of silt.	42.5	52	9.5	42.5 to 52	13.1	1.13	5.5	ST
46										
48										
50										

Limited Overburden

Water Table

Great Reserves- consistent FM, low LBW, high gravel content,

Questionable Reserves

Interburden (removable in the dry)

Drilling Co.	ECL	Property	Field	Hole #	F19-G13		
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Finish Time	10:15 AM 4/5/2001	Logged By	Tim Higbee	Water Depth	61.5'		
Total Depth	97'	Drill Method	Auger				

Comments:

Graphical log Depth	Litho.	Description	From (feet)	To (feet)	Interval Thickness	Sample Interval	Lab Analysis LBW	FM	%Gr.	Note
52		Light yellow fine sand with some thin bands of silt.	42.5	52	9.5	42.5 to 52	13.1	1.13	5.5	ST
54		Yellow medium sand with 20% fine gravel and some thin bands of gray coarse sand with 40% fine gravel.	52	61.5	9.5	52 to 61.5	5.5	2.56	30.6	S&G
56										
58										
60										
62		Yellow to brown medium sand with occasional fine gravel.	61.5	64	2.5	61.5 to 64	5.4	2.31	6.1	MSD
64										
66		Grayish brown coarse sand with 20% fine gravel.	64	72	8	64 to 72	3.4	2.97	23.2	S&G
68										
70										
72										
74		Brown to light yellow fine sand with occasional thin bands of medium sand and fine gravel.	72	84	12	72 to 84	8.1	1.89	7.9	FSD
76										
78										
80										
82										
84										
86		Gray coarse sand with 25% fine gravel.	84	97	13	84 to 97	4.4	2.77	21.5	S&G
88										
90										
92										
94										
96										
98		T.D. 97'								
100										

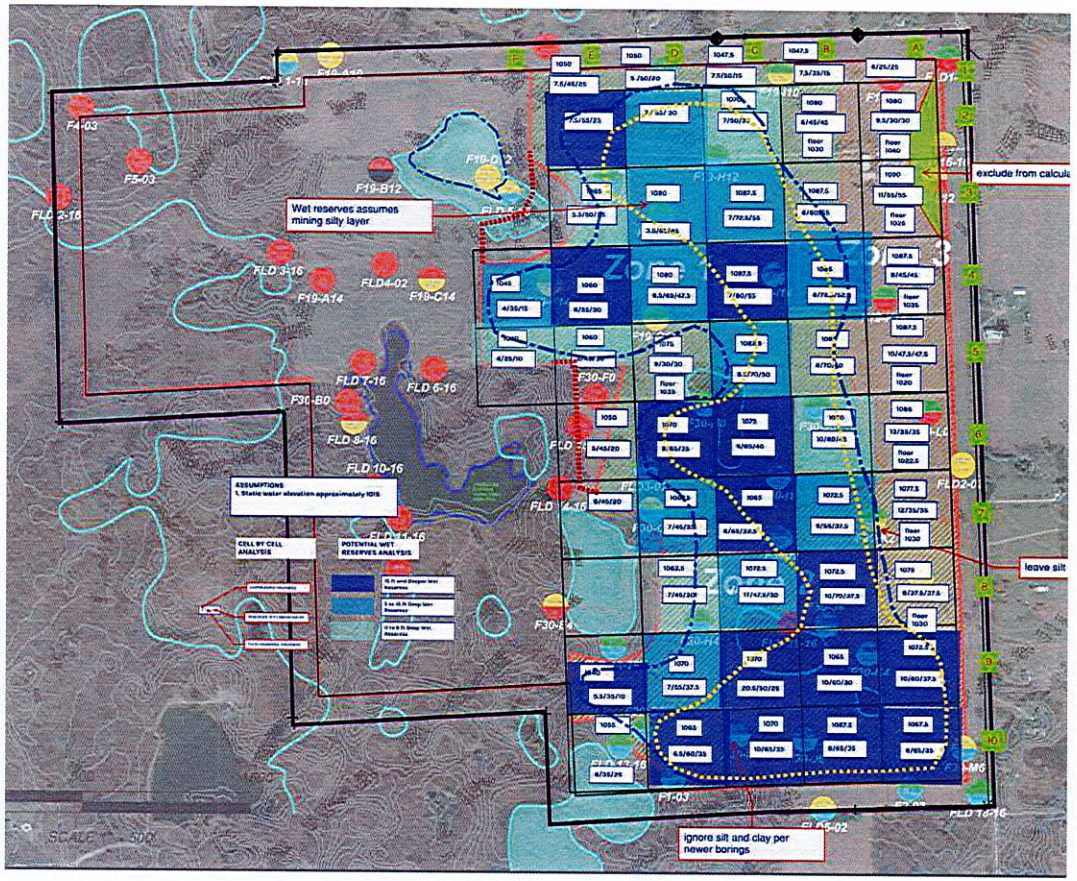
RESULTS FOR SPRINGFIELD SITE

STEP ONE: UNDERSTANDING THE SITE AND GEOLOGY

GEOLOGIC FRAMEWORK

1. Establish pit bottom elevation and shape
2. Quantify overburden and minable reserves by area
3. Estimate OB required for basic reclamation

Abundant, quality sand and gravel deposits, however, are not equally distributed across the state and are not always located close to population centers where demand is the greatest. (MDNR, 2017)



UNDERSTAND BASIC MINING CONDITIONS

STEP TWO: OPERATIONS PLANNING

REGULATORY FRAMEWORK

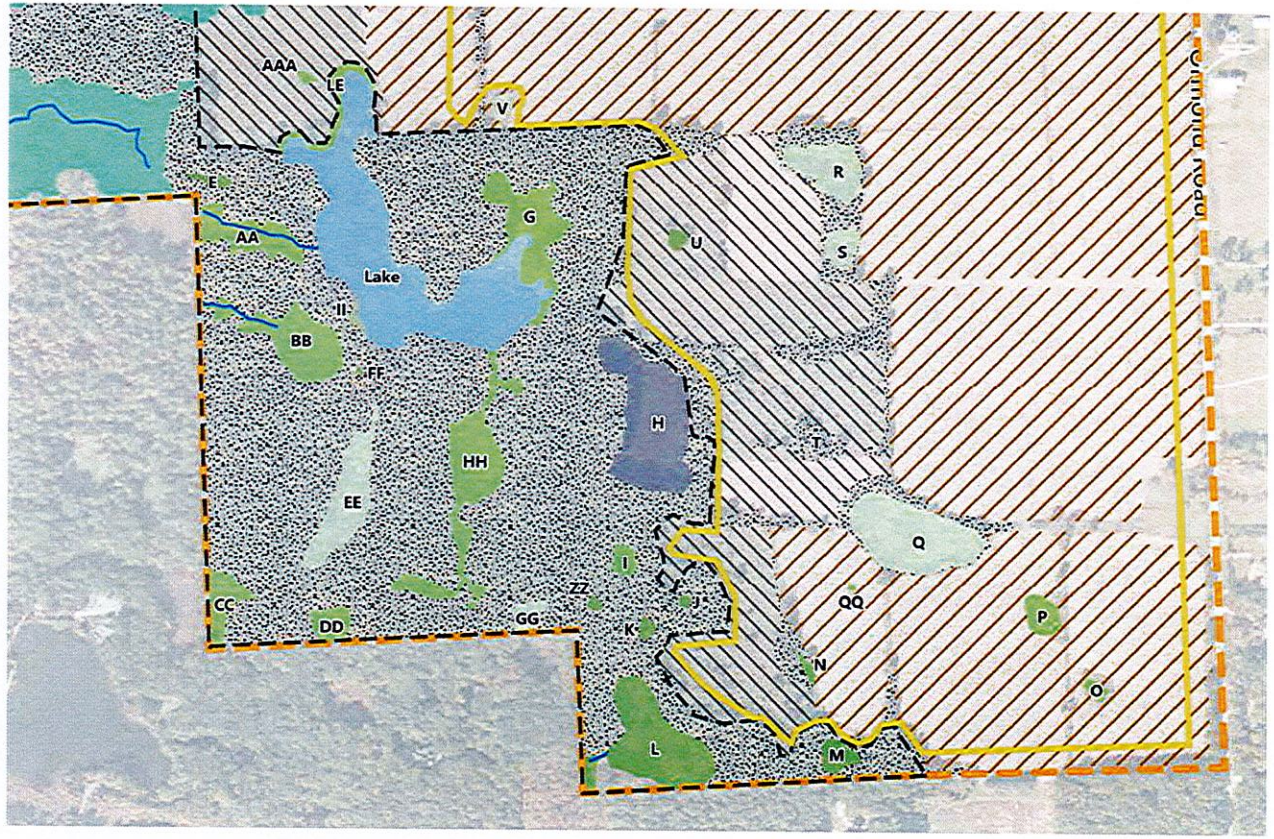
- Mining setbacks from roads, property lines, and residential homes
- Processing equipment setbacks
- Natural features setbacks
- Screening and fencing
- Concurrent Reclamation

UNDERSTAND BASIC MINING CONDITIONS

STEP TWO: OPERATIONS PLANNING

Stewardship Goals

- Protect natural resources as a community and natural asset for the future
- Conduct our operations with integrity
- Shape the land through mining and operations to create re-use opportunities

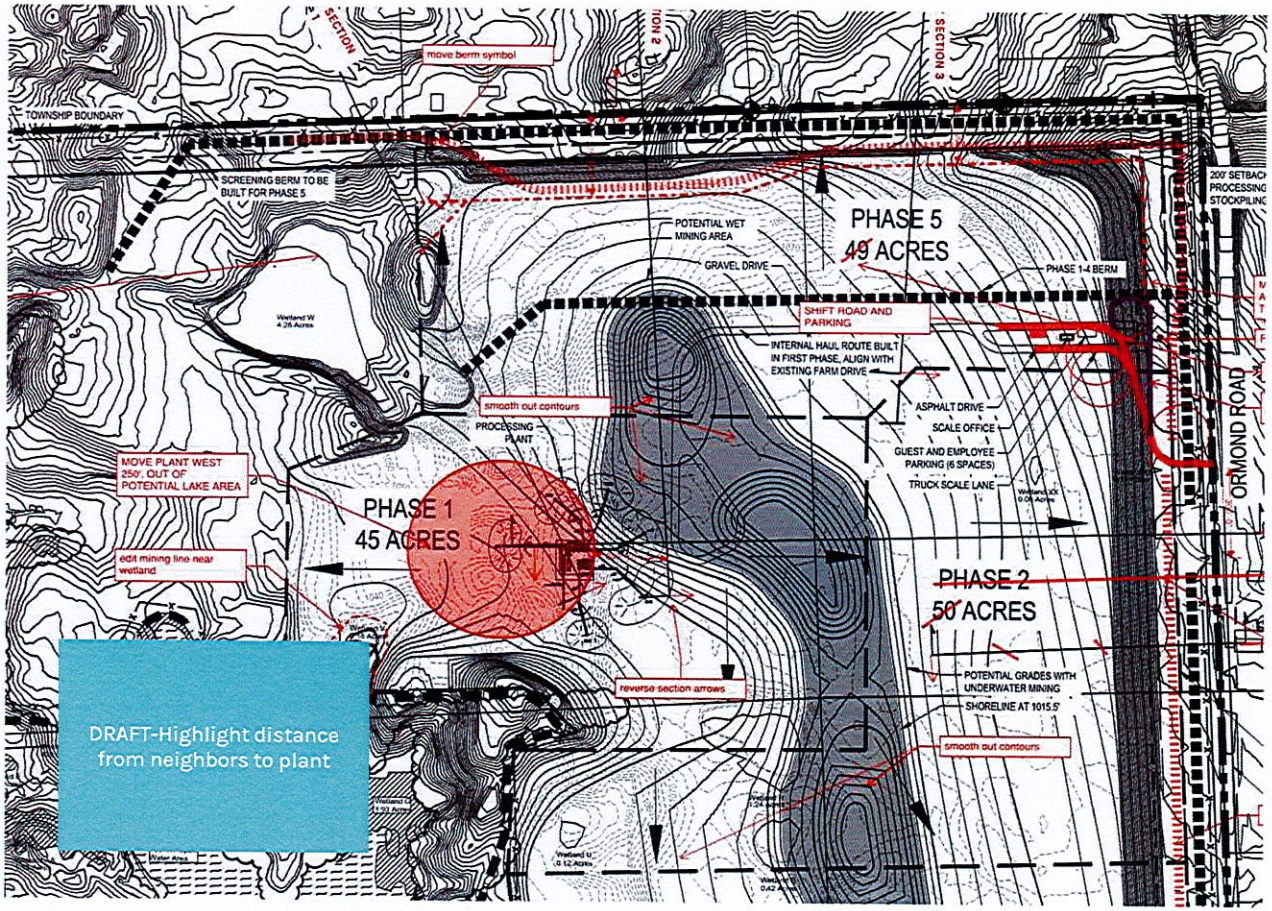


MINING OPERATIONS PLAN

STEP TWO: OPERATIONS PLANNING

LOCATE PLANT,
considering-

- Isolation from neighbors
- Elevation and screening potential
- Space requirements
- Plant installation and initial mining phase and berm building

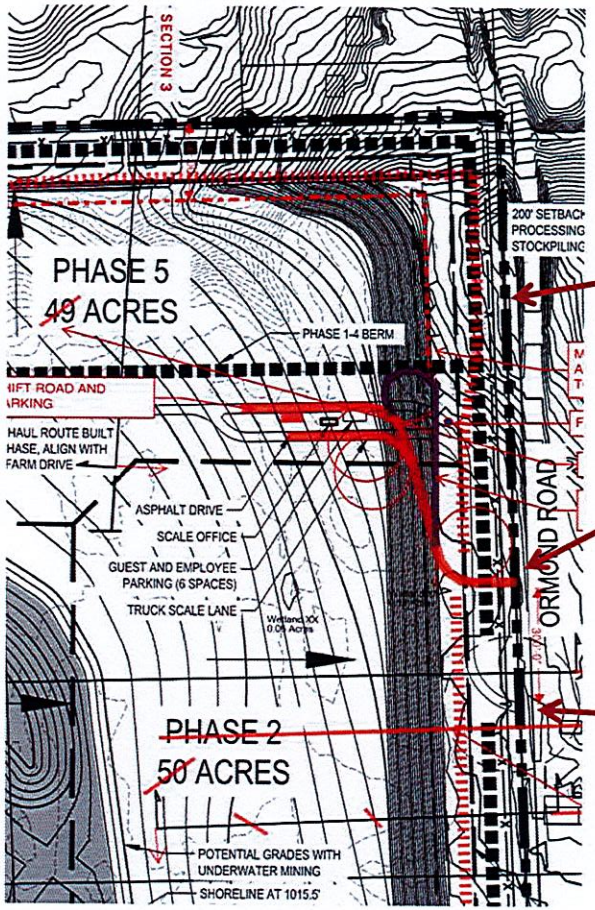


MINING OPERATIONS PLAN

STEP TWO: OPERATIONS PLANNING

LOCATE SITE ACCESS,
considering-

- Sight distance
- Condition of adjacent roads
- Adjacent neighbors
- Proximity to suitable road network



+/- 1,000 feet of sight distance (500 feet required)

Site entry with Ormond Road improvements

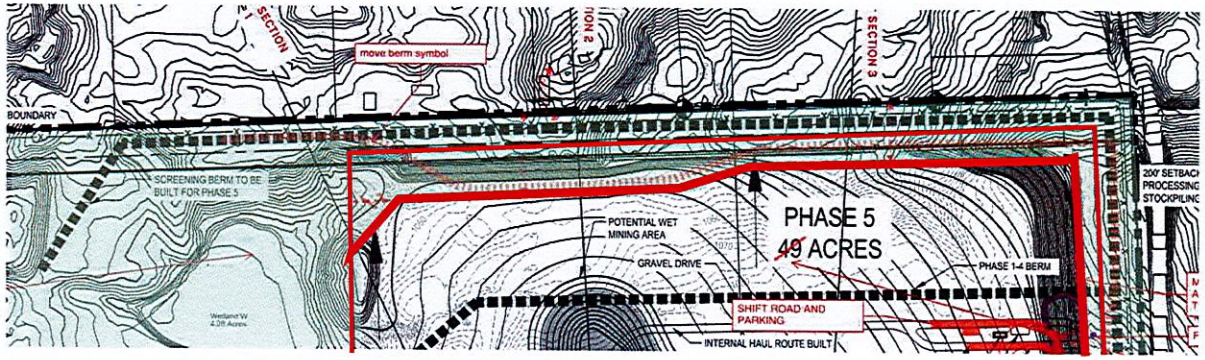
Closest neighbor's driveway 300 ft to south

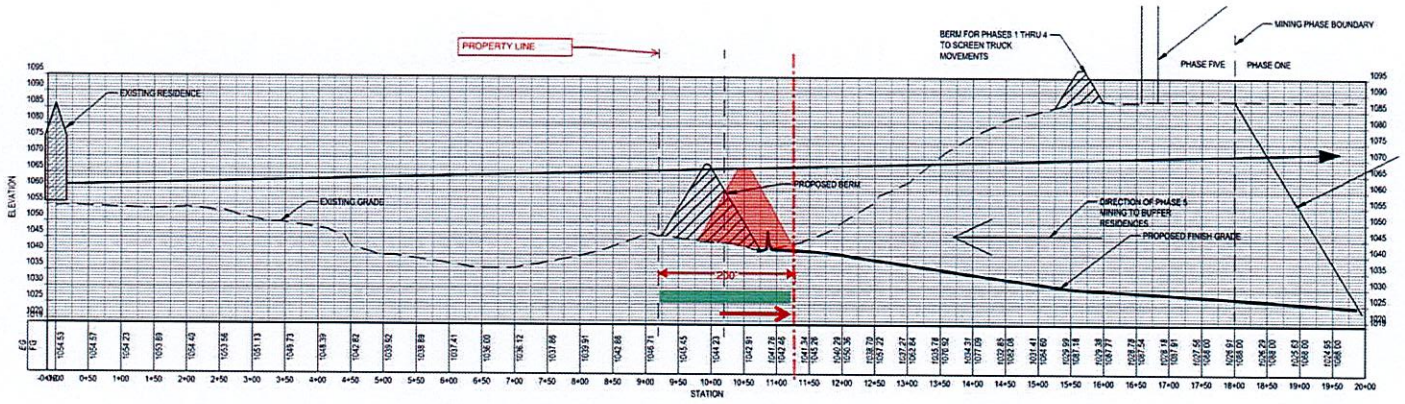
MINING OPERATIONS PLAN

STEP TWO: OPERATIONS PLANNING

PLAN SETBACKS AND BERMS, considering-

- Proximity and density of homes
- View from adjacent roads
- Balancing effective screening and rural character



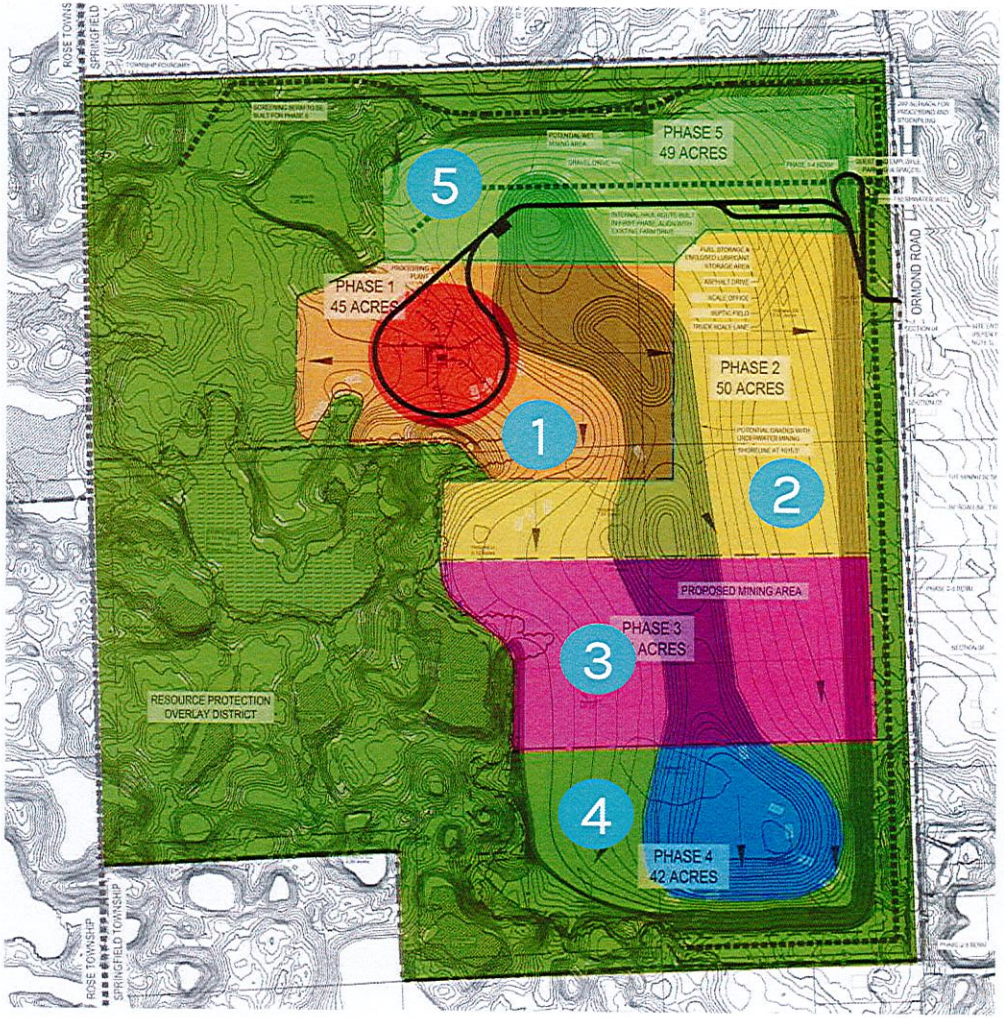


MINING OPERATIONS PLAN

STEP TWO: OPERATIONS PLANNING

ESTABLISH SEQUENCE OF MINING AND RECLAMATION,
considering-

- Setting plant at lower elevation
- Screening and landscaping
- Direction of mining to use topography for sound mitigation
- Moving soils to efficiently reclaim site



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STEP TWO: OPERATIONS PLANNING

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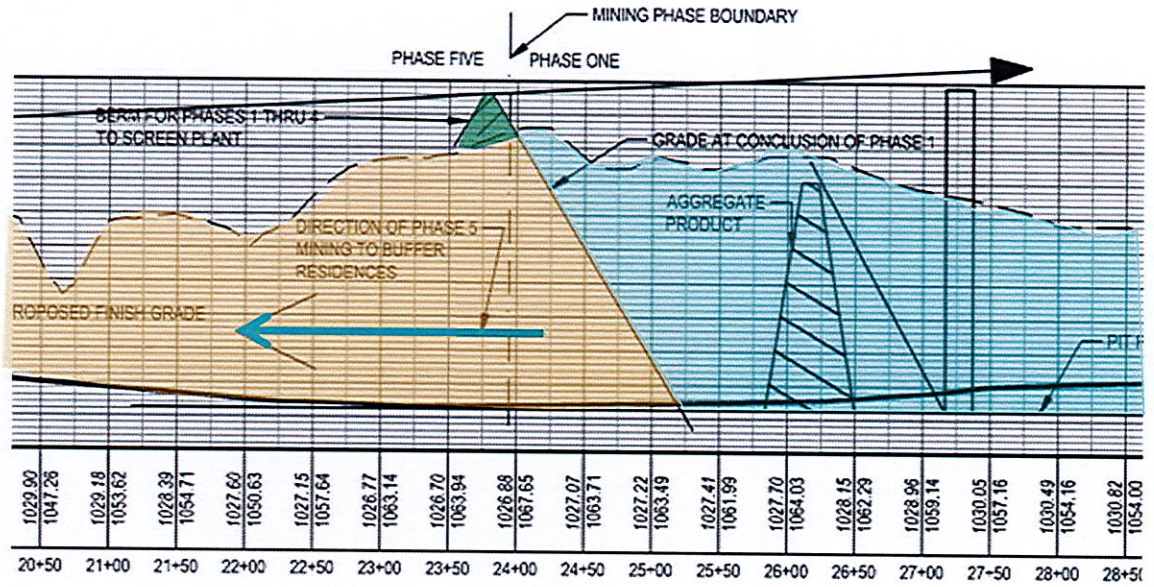


DEVELOP RECLAMATION CONCEPT PLAN

STEP THREE: RECLAMATION CONCEPT

DETERMINE EARTHMOVING STRATEGY-

- Start with OB needed to reclaim slopes
- Balancing overburden for pit floor with quantity available

Consider regulatory requirements

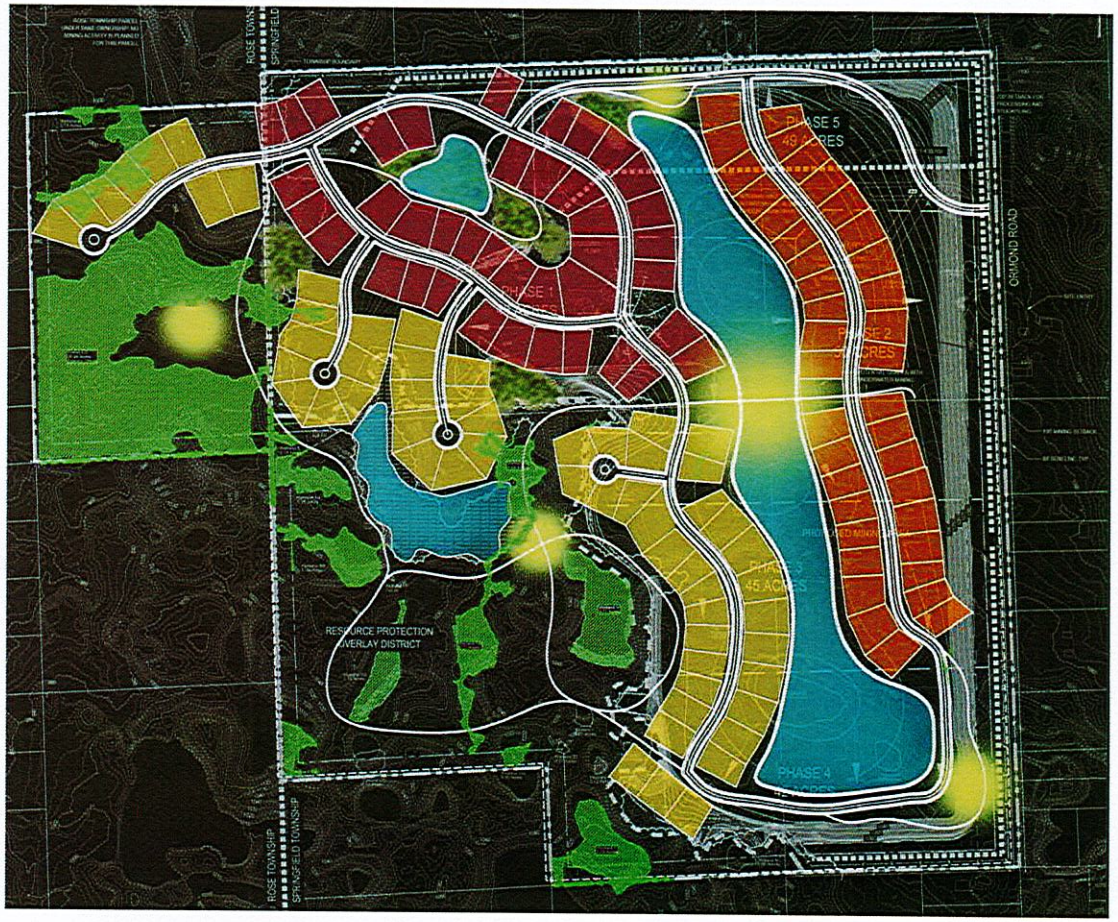
- Restored maximum slope for uplands
- Below water reclamation slopes and water depth
- No imported fill

DEVELOP RECLAMATION CONCEPT PLAN

STEP THREE: RECLAMATION PLANNING

EXPLORE FUTURE LAND USE CONCEPTS

- Consider potential redevelopment scenarios and identify common requirements
- Set Mining/Reclamation parameters to maximize future flexibility for development of the site
- Recognize that the future community development goals will evolve.



DEVELOP RECLAMATION CONCEPT PLAN

STEP THREE: RECLAMATION PLANNING

EXPLORE FUTURE LAND USE CONCEPTS

It is too early to tell how the site may be developed; however, the mining and reclamation can provide a site for a range of development types.

Plan with mix of housing types

Plan with large lot housing type

SITE ACTIVITIES

STEP FOUR: IMPLEMENTATION

EXTRACTION

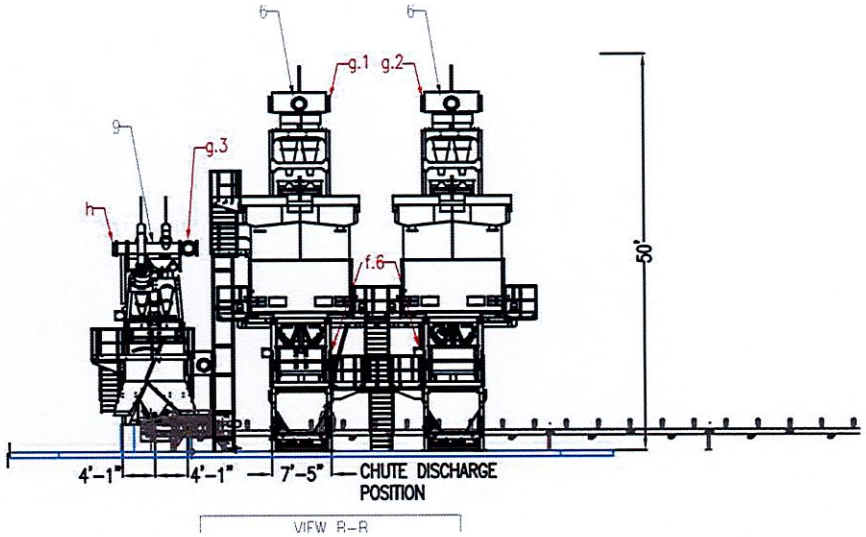
- Prepare area for mining by stripping soils.
- Excavate bank of aggregate, or
- Excavate from below water and stockpile to drain
- Load into hopper
- Transport to wash plant with conveyers and/or trucks

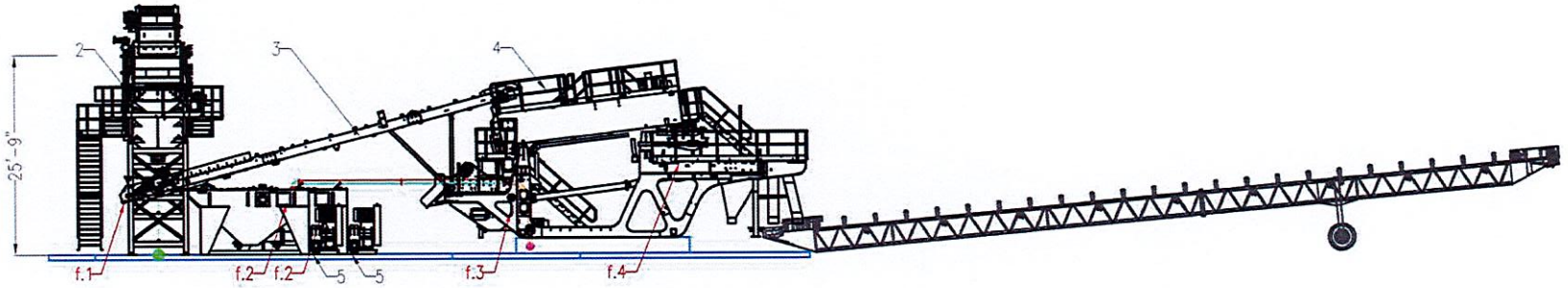
SITE ACTIVITIES

STEP FOUR: IMPLEMENTATION

PROCESSING

- Feed raw material into plant
- Washed with water, screened, and sorted aggregate
- Crush stone (in some cases)
- Segregate into product piles
- Load trucks





SITE ACTIVITIES

STEP FOUR: IMPLEMENTATION

RECLAIM

- Use removed soils for reclamation-pit floor, restored slopes, screening berms
- Reclaim the site on an ongoing basis to minimize exposed earth and absorb costs over time

THE PLANNING CONTINUES

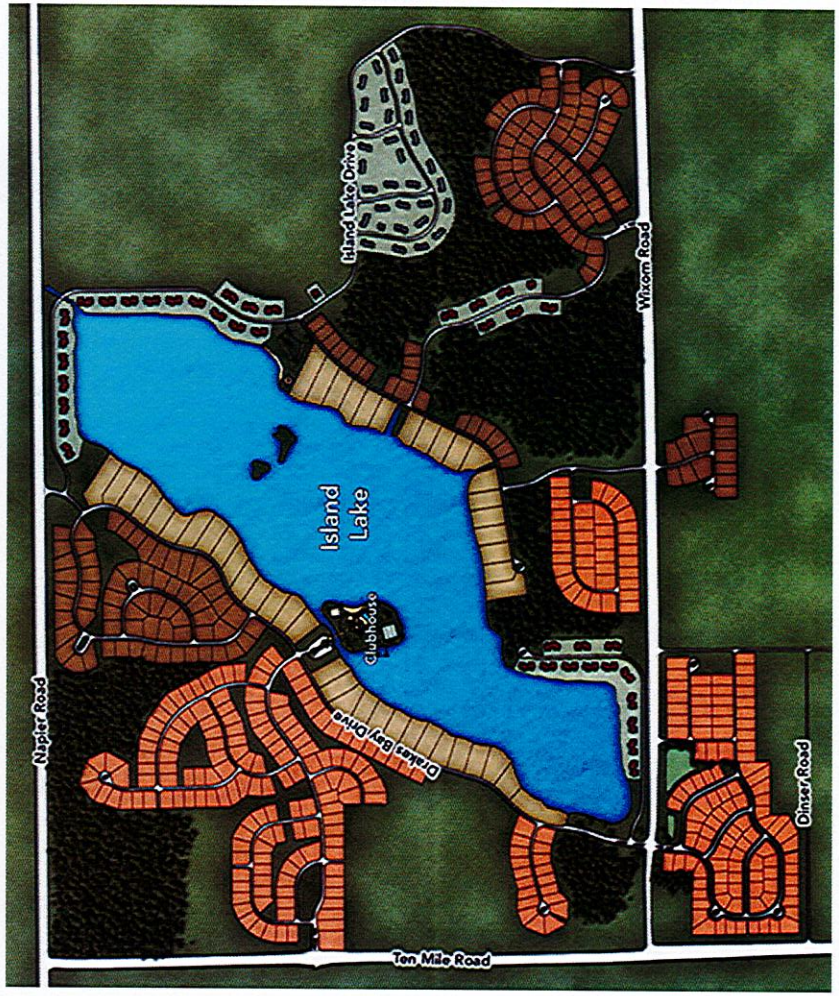
STEP FOUR: IMPLEMENTATION

ANNUAL PLANNING AND PERMITTING

- Annual operations planning process to manage ongoing mining and reclamation
- Supplemental geologic studies
- Update annual permit application
- Review by township
- Site tour to confirm compliance

SUCCESS STORIES

ISLAND LAKE OF NOVI (NOVI, MICHIGAN)



SUCCESS STORIES

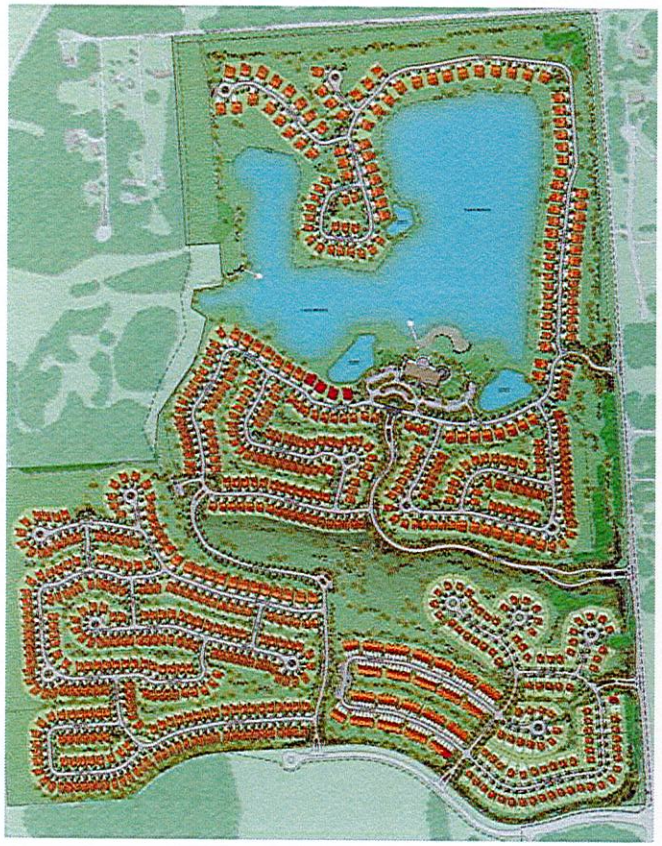
WATERSTONE (OXFORD, MICHIGAN)

SUCCESS STORIES

MAPLE LAKE FARMS (MILFORD, MICHIGAN)

SUCCESS STORIES

KENSINGTON RIDGE (MILFORD, MICHIGAN)



CONCLUSIONS

- Assessments of the mining operation and existing site have concluded that no serious consequences are anticipated to:
    - Regulated wetlands
    - Significant natural resources
    - Ground water level or quality
    - Traffic operations on adjacent roads

- BMC is volunteering to adhere to mining setbacks greater than regulations call for.

- The proposed mining and reclamation activity will be in conformance to relevant township regulations, including noise, airborne emissions, vibration, natural features protection, waste disposal, exterior lighting, hazardous substances, and mining related ordinances.

- No exceptions or variances are requested.

- All required state, federal, and county permits will be obtained in a timely fashion and regulations adhered to.

QUESTIONS?

Ric Davis

From:	Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent:	Monday, June 23, 2025 11:02 AM
To:	Dean Baker
Cc:	Kevin Sclesky; Jamie Costigan; Ruth Ann Hines; Brian Galley; Steve Felix; George Mansour; Ric Davis; Sean Miller; Stephen R. Estey; Irit Walters; Bob Doyle
Subject:	[EXTERNAL] Tomorrow's Planning Commission Meeting

Dear Chairman Baker,

It is our understanding that the Planning Commission would like us to provide a full presentation for the public hearing. Therefore, it is our intention, unless you suggest otherwise, for tomorrow evening's presentation to be similar to what we previously presented. We recognize that neighbors were noticed for this meeting, so we intend to share a thorough overview of our proposed project, as we did last month.

Following our presentation, we understand the public will be able to provide statements limited to 3 minutes per person as part of the public hearing. We do not intend to get in a back and forth with the public, but at the conclusion of the public hearing we will, of course, respond to any questions the Planning Commission has.

In the alternative, perhaps it would make the most sense for us to compile a list of citizen comments during public comment, and then provide a written FAQ or response to the Planning Commission for the public record after the meeting. Regardless, we do not want to get into a back and forth Q & A with the public as that will not be practical or efficient given the number of expected participants.

Please let me know your thoughts.

Thank you,
Reuben

Ric Davis

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Monday, June 23, 2025 4:32 PM
To: Dean Baker
Cc: Kevin Sclesky; Jamie Costigan; Ruth Ann Hines; Brian Galley; Steve Felix; George Mansour; Ric Davis; Sean Miller; Stephen R. Estey; Irit Walters; Bob Doyle
Subject: [EXTERNAL] Re: **EXTERNAL**Re: Tomorrow's Planning Commission Meeting

Dear Chairman Baker,

Thank you for your response and for helping us prepare for tomorrow evening. We look forward to being back in front of the Planning Commission.

Best,
Reuben

From: Dean Baker <dbaker@springfield-twp.us>
Date: Monday, June 23, 2025 at 4:28 PM
To: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Cc: Kevin Sclesky <ksclesky@springfield-twp.us>, Jamie Costigan <jcostigan@springfield-twp.us>, Ruth Ann Hines <rhines@springfield-twp.us>, Brian Galley <bgalley@springfield-twp.us>, Steve Felix <sfelix@springfield-twp.us>, George Mansour <gmansour@springfield-twp.us>, Ric Davis <rdavis@springfield-twp.us>, Sean Miller <smiller@springfield-twp.us>, Stephen R. Estey <sestey@zausmer.com>, Irit Walters <iwalters@zausmer.com>, Bob Doyle <bob.doyle@smithgroup.com>
Subject: **EXTERNAL**Re: Tomorrow's Planning Commission Meeting

Mr Maxbauer,

I would suggest you be prepared to give us an overview as you did at our May Planning Commission meeting.

I intend to open the Public Hearing by inviting our Planner to offer an overview of the proposal, then I will ask Levy to make their presentation.

When you conclude, I will invite the Planning Commissioners to ask questions of our Planner and the Levy representatives.

Once the Planning Commissioners have asked their questions I will invite those in attendance to address their comments to the Planning Commission.

We will not be inviting the public to ask the Levy representatives questions directly as part of the Public Hearing.

Thank you for your note,

Dean Baker

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Monday, June 23, 2025 11:01 AM
To: Dean Baker <dbaker@springfield-twp.us>
Cc: Kevin Sciesky <ksciesky@springfield-twp.us>; Jamie Costigan <jcostigan@springfield-twp.us>; Ruth Ann Hines <rhines@springfield-twp.us>; Brian Galley <bgalley@springfield-twp.us>; Steve Felix <sfelix@springfield-twp.us>; George Mansour <gmansour@springfield-twp.us>; Ric Davis <rdavis@springfield-twp.us>; Sean Miller <smiller@springfield-twp.us>; Stephen R. Estey <sestey@zausmer.com>; Irit Walters <iwalters@zausmer.com>; Bob Doyle <bob.doyle@smithgroup.com>
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Please let me know your thoughts.

Thank you,
Reuben

Ric Davis

From: Ric Davis
Sent: Thursday, June 26, 2025 8:20 AM
To: Maxbauer, Reuben
Subject: Fw: [EXTERNAL] Comment regarding Edw. C. Levy Co gravel mine
Attachments: GLELC Public Comment - Edw C Levy Gravel Mine.pdf

Please send an explanation regarding this report.
Ric Davis

Get Outlook for iOS

From: Supervisor's Office
Sent: Wednesday, June 25, 2025 10:31:35 PM
To: Jamie Dubre <jdubre@springfield-twp.us>
Subject: FW: [EXTERNAL] Comment regarding Edw. C. Levy Co gravel mine

From: Andrew Bashi <andrew.bashi@glelc.org>
Sent: Wednesday, June 25, 2025 3:54 PM
To: Clerk's Office <clerk@springfield-twp.us>; Supervisor's Office <supervisor@springfield-twp.us>
Cc: fisher@cooley.edu; Dean Baker <dbaker@springfield-twp.us>; Kevin Sclesky <ksclesky@springfield-twp.us>; Jamie Costigan <jcostigan@springfield-twp.us>; Ruth Ann Hines <rhines@springfield-twp.us>; Brian Galley <bgalley@springfield-twp.us>; Steve Felix <sfelix@springfield-twp.us>; George Mansour <gmansour@springfield-twp.us>
Subject: [EXTERNAL] Comment regarding Edw. C. Levy Co gravel mine

Supervisor Davis, Clerk Miller, and members of the Springfield Township Planning Commission,

Attached for your review is a comment on behalf of the Great Lakes Environmental Law Center regarding the gravel mine proposed by Edw. C. Levy Co. I hoped to attend the public session yesterday and to provide copies of it to you in person but the storm had other plans.

Our organization is very familiar with the operations of the Levy Company. We are currently litigating a permit they received from the Michigan Department of Environment, Great Lakes, and Energy to construct a slag grinding plant directly across from Zug Island in Southwest Detroit, the most polluted community in the state.

Based on the company's history of non-compliance and the foreseeable impacts this facility will have on air and water quality as well as property values, we do not believe the company can demonstrate it will not cause very serious consequences.

Thank you in advance for your consideration and please feel free to contact me if you have any questions.

Andrew "abu-Zaeem" Bashi

Staff Attorney

Great Lakes Environmental Law Center

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GREAT LAKES ENVIRONMENTAL LAW CENTER

June 24, 2025

Springfield Township Planning Commission
Charter Township of Springfield
12000 Davisburg Road
Davisburg, Michigan 48350

Public Comment: Edw. C. Levy Co (Burroughs Materials) Mining Project

The Great Lakes Environmental Law Center ("GLEC") is a nonprofit public interest environmental law organization dedicated to protecting communities across Michigan through legal advocacy. GLEC has represented communities, environmental organizations, and concerned citizens in complex environmental permitting matters involving extractive industries.

I. Introduction

The evidence before this Commission reveals three converging grounds that mandate denial under MCL 125.3205(5). First, the applicant's extensive violation history demonstrates inability to operate in compliance with environmental standards, creating inevitable "very serious consequences" for Springfield Township. Second, peer-reviewed scientific research establishes that gravel mining operations systematically contaminate groundwater, destroy irreplaceable wetland ecosystems, and generate harmful air quality impacts—consequences that are permanent and irreversible. Third, documented economic studies prove that gravel operations cause catastrophic property value destruction, with homes within half a mile suffering a 36% value loss and total community losses exceeding $31 million in comparable townships.

The choice before this Commission transcends a single permit application. It represents a fundamental decision about whether local communities retain meaningful authority to protect their residents from industrial operations with documented histories of environmental harm. When state regulators abdicate their responsibility to consider operator compliance history, local planning authorities serve as the final guardians of community welfare.

II. Legal Background

Under Michigan law, townships possess clear authority to deny mining permits when operations would result in very serious consequences. The burden falls on the mining company to prove three essential elements: that valuable natural resources exist, that market need exists for the resources, and that no very serious consequences would result from mining the resources.[1]

In determining whether very serious consequences would result from the operation, Michigan law permits consideration of multiple factors, including the relationship of extraction with existing land uses, the impact on existing land uses in the vicinity of the property, the impact on property values in the vicinity and along proposed hauling routes, the impact on pedestrian and traffic safety, the impact on identifiable health, safety, and welfare interests in the local government, and the overall public interest in the extraction of the specific natural resources.[2]

III. The Applicant Failed to Demonstrate its Operation Meets Legal Standards for Approval

The evidence presented herein demonstrates that this proposed operation fails to meet the legal standards for approval under each of these criteria.

A. Applicant's Market Need Claims Rest on Demonstrably Corrupted State Analysis

The 2019 Michigan Office of the Auditor General's investigative audit reveals that Levy Co.'s Executive Vice President and COO, S. Evan Weiner, while serving as Chair of Governor Snyder's 21st Century Infrastructure Commission, systematically corrupted state decision-making processes through direct executive manipulation of an aggregates market study—the very type of market analysis that mining companies must now demonstrate to satisfy Michigan's requirement that "market need exists for the resources."

The manipulated study was explicitly designed to manufacture evidence of aggregate shortages that mining companies like Levy Co. could cite, in the words of an industry stakeholder seeking a private meeting between MDOT's director and Weiner, to "substantiate our claim" that "the aggregate industry will be unable to meet the foreseeable market demands if only existing permitted mines are utilized."[3] The Michigan Aggregates Association recommended the consultant

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[1] Mich. Comp. Laws § 125.3205(5)(a)–(f)

[2] Id.

[3] Mich. Office of the Auditor Gen., Investigative Audit Report: Michigan Department of Transportation's Procurement of the Michigan Aggregates Market Study 8–9 (2019).

MDOT hired, set out the scope of work and how to price the study, and provided predetermined conclusions supporting expanded mining operations.

When MDOT attempted to develop an independent science-based approach for Phase 2, state employees were explicitly overruled because the proposal was "not what the [industry stakeholder] had in mind," forcing MDOT to abandon objective analysis in favor of industry preferences. The audit reveals that "upper management wanted MDOT to use the [industry stakeholder's] suggested Phase 2 scope" despite staff warnings that the industry sought "a tool...to engage in legislation that eases the permitting process by taking permitting authority away from local agencies."[4] In the end, the report converted approximately $100,000 in taxpayer resources into what the audit determined was advocacy material providing "little value" as legitimate research.[5]

The corrupted study's conclusions about aggregate shortages have since been cited by industry representatives in legislative testimony to support new mining permits and weaken local regulatory authority.[6]

Levy Co.'s current application likely relies on market analyses that trace directly to this manipulated research, creating a circular scheme where the company corrupts government studies to manufacture the market justifications required for their own permit applications.

When Levy Co.'s senior leadership demonstrably corrupts the very type of market analysis required under Michigan law to justify mining permits, any market need claims in their current application are fundamentally suspect.

B. Applicant's Systematic Environmental Violations Create Rebuttable Presumption of Future Non-Compliance

The applicant's violation record reveals a corporate culture of disregard that standard regulatory enforcement has proven powerless to correct. Despite accumulating nearly 100 violations across air quality, water discharge, stormwater management, and operational standards at facilities throughout Michigan, Edw. C. Levy Co. continues not only to operate but to seek expansion.

The pattern is unmistakable: at Levy Plant 6 alone, the company has received seventeen citations for "unreasonable interference with the comfortable enjoyment of life and property" between 2015 and 2024. At Cadillac-Wixom, three such violations occurred in 2024 alone. The company's Specification Stone Products

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[4] Id. at 10-11.
[5] Id. at 11-12.
[6] Paul Egan, Emails Show MDOT Let Lobbyist Steer Report on Gravel Shortage for Michigan Roads, *Detroit Free Press* (2019)

facility has violated NPDES permit requirements eighteen times since 2016, including recent unpermitted discharges and inadequate maintenance violations as recent as April 2025.

Where state air quality regulators have demonstrated unwillingness to consider operator compliance history when evaluating permit applications—a position currently under challenge by our organization before the Michigan Court of Appeals—local planning authorities represent the final safeguard protecting community welfare from operators with demonstrated patterns of environmental destruction.[7]

Given that state air quality regulators have demonstrated unwillingness to consider operator compliance history, local planning authorities represent the last line of defense in protecting community welfare from operators with demonstrated patterns of environmental non-compliance. They may be the only entities that will consider the operator's compliance history when evaluating projects impacting community health and safety.

Violation History of Edw. C. Levy Co. and Subsidiaries at its Michigan Facilities		
Facility	**Date**	**Violation**
Ace - Saginaw Paving Co - Holly A1	12/12/2006	AQD_AIR - AQD - Air
Ace - Saginaw Paving Co - Holly A1	12/11/2007	AQD_AIR - AQD - Air
Ace - Saginaw Paving Co - Flint	01/09/2023	NPDES - Failure to Conduct Visual Assessments as Required
Ace - Saginaw Paving Co - Flint	01/09/2023	NPDES - Failure to Conduct Inspections as Required
Ace - Saginaw Paving Co - Plant 4 - Ubly S4	09/26/2012	AQD_AIR - AQD - Air
Ace - Saginaw Paving Co - Plant 9	07/21/2021	NPDES - Deficient SWPPP
Ace - Saginaw Paving Co - Plant 9	06/14/2023	AQD_AIR - AQD - Air
Ace - Saginaw Paving Co - Port Huron A4	10/11/2023	NPDES - Poor Housekeeping
Ace - Saginaw Paving Co - Saginaw	07/21/2021	NPDES - Deficient SWPPP

[7] Concerned Residents for South Dearborn v MI Dept. Environment, Great Lakes, and Energy, No. 373632 (MI Ct. App., Brief for Appellants filed May 27, 2025)

Ace - Saginaw Paving Co - Saginaw	07/22/2021	NPDES - Deficient SWPPP
Ace - Saginaw Paving Co - Sheridan Pit	06/23/2008	NPDES - WRD - NPDES
Ace - Saginaw Paving Co - Sheridan Pit	07/21/2008	NPDES - WRD - NPDES
Ace - Saginaw Paving Co - Sheridan Pit	06/05/2015	NPDES - WRD - NPDES
Ace - Saginaw Paving Co - Sheridan Pit	03/02/2016	NPDES - WRD - NPDES
Ace - Saginaw Paving Co - Sheridan Pit	07/28/2022	NPDES - WRD - NPDES
American Aggregates - Buno Plant	04/10/2017	NPDES - Poor Housekeeping
American Aggregates - Buno Plant	05/19/2017	NPDES - Compliance Schedule Not Received by Due Date - (Due: 05/15/2017)
American Aggregates - Grange Hall Road	04/26/2022	GROUNDWATER - Failure to Properly Maintain All Treatment, Control Facilities and/or Systems
American Aggregates - Ray Road	12/13/2011	NPDES - WRD - NPDES
Blue Water Aggregates	04/09/2024	NPDES - Failure to Implement SWPPP Requirements
Burroughs Materials-Docks	07/22/2021	NPDES - Failure to Conduct Visual Assessments as Required
Burroughs Materials-Docks	07/22/2021	NPDES - Deficient SWPPP
Cadillac - Clarkston	07/07/2016	AQD_AIR - Monitoring/Recordkeeping
Cadillac - Clarkston	09/28/2020	AQD_AIR - Process/Operational Restrictions
Cadillac - Dix - Detroit	09/28/2006	NPDES - WRD - NPDES
Cadillac - Gerken Materials	02/23/2021	AQD_AIR - Emission Limits
Cadillac - Gerken Materials	02/23/2021	AQD_AIR - Emission Limits
Cadillac - Rawsonville	11/07/2017	AQD_AIR - Monitoring/Recordkeeping
Cadillac - Rawsonville	11/07/2017	AQD_AIR - Monitoring/Recordkeeping
Cadillac - Rawsonville	08/21/2023	NPDES - Deficient SWPPP
Cadillac - Romulus	08/04/2023	NPDES - Deficient SWPPP
Cadillac - Wixom	7/26/2024	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Cadillac - Wixom	10/18/2024	AQD_AIR - Process/Operational Restrictions
Cadillac - Wixom	10/18/2024	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 1	12/02/2015	AQD_AIR - Monitoring/Recordkeeping
Levy Plant 1	12/02/2015	AQD_AIR - Monitoring/Recordkeeping

Levy Plant 1	12/02/2015	AQD_AIR - Monitoring/Recordkeeping
Levy Plant 2	01/10/2016	NPDES - Compliance Schedule Not Received by Due Date (Annual SWPPP Review Report - (Due: 01/10/2016)
Levy Plant 2	10/13/2021	NPDES - Deficient SWPPP
Levy Plant 3	01/10/2016	NPDES - Compliance Schedule Not Received by Due Date (Annual SWPPP Review Report - (Due: 01/10/2016)
Levy Plant 3	10/21/2016	AQD_AIR - Monitoring/Recordkeeping
Levy Plant 3	10/21/2016	AQD_AIR - Monitoring/Recordkeeping
Levy Plant 3	05/22/2019	NPDES - Deficient SWPPP
Levy Plant 3	08/17/2022	AQD_AIR - Testing/Sampling
Levy Plant 3	08/17/2022	AQD_AIR - Monitoring/Recordkeeping
Levy Plant 3	08/17/2022	AQD_AIR - Monitoring/Recordkeeping
Levy Plant 3	02/29/2024	NPDES - Storm Water Exposure
Levy Plant 6	10/28/2015	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	11/07/2015	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	12/08/2015	AQD_AIR - 2nd VN Notice
Levy Plant 6	03/13/2017	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	05/30/2017	AQD_AIR - 2nd VN Notice
Levy Plant 6	11/21/2018	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	07/16/2019	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	09/12/2019	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	11/19/2019	AQD_AIR - Emission Limits
Levy Plant 6	11/19/2019	AQD_AIR - Monitoring/Recordkeeping
Levy Plant 6	11/19/2019	AQD_AIR - Process/Operational Restrictions
Levy Plant 6	11/19/2019	AQD_AIR - Reporting
Levy Plant 6	11/19/2019	AQD_AIR - Reporting
Levy Plant 6	11/19/2019	AQD_AIR - Reporting
Levy Plant 6	11/19/2019	AQD_AIR - Process/Operational Restrictions
Levy Plant 6	12/21/2020	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	12/21/2020	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	12/21/2020	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	11/18/2021	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property

Levy Plant 6	06/02/2022	NPDES - Deficient SWPPP
Levy Plant 6	08/12/2022	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	10/13/2022	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	07/28/2023	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	07/31/2023	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	09/28/2023	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	10/06/2023	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	04/02/2024	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy Plant 6	06/21/2024	AQD_AIR - Unreasonable interference with the comfortable enjoyment of life and property
Levy-Brennan Street Dock	09/15/2023	NPDES - Storm Water Exposure
Levy-Penn Landfill	01/10/2016	NPDES - Compliance Schedule Not Received by Due Date (Annual SWPPP Review Report - (Due: 01/10/2016)
Levy-Penn Landfill	08/01/2023	NPDES - Records Retention
Specification Stone Products - Alpena	07/21/2016	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	07/21/2017	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	05/21/2018	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	07/21/2018	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	08/21/2018	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	10/21/2018	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	03/21/2019	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	04/21/2019	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	05/21/2020	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	12/21/2020	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	06/28/2021	NPDES - Improper Sampling Methods

Specification Stone Products - Alpena	08/21/2022	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	11/21/2022	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	04/17/2025	NPDES - Unpermitted Discharge
Specification Stone Products - Alpena	04/17/2025	NPDES - Inadequate Maintenance
Specification Stone Products - Alpena	04/17/2025	NPDES - Narrative Standard
Specification Stone Products - Alpena	04/21/2025	NPDES - DMR not submitted by due date
Specification Stone Products - Alpena	05/21/2025	NPDES - DMR not submitted by due date

C. Past Violations to Future Harm: Scientific Evidence Confirms Environmental Destruction from Mining Operations

Edw. C. Levy Co.'s violation history is not merely a record of past misconduct. This violation pattern transforms from historical fact to imminent threat when considered alongside the comprehensive body of peer-reviewed research demonstrating that gravel mining operations systematically degrade the precise environmental resources the company has repeatedly failed to protect. Where regulatory enforcement has proven insufficient to ensure compliance at existing facilities, Springfield Township cannot reasonably expect different outcomes from the same operator conducting the same inherently destructive activities.

1. Gravel Extraction Creates Direct Pathways for Permanent Groundwater Contamination

Extraction of gravel, by its very nature, inherently and profoundly alters landscapes and natural hydrologic systems. It does so by consuming, diverting, and polluting water resources, leaving a lasting environmental legacy. Independent scientific research conducted at sites across the United States demonstrate that gravel mining operations fundamentally alter groundwater systems, even without employing dewatering, primarily due to the disturbance of ecological systems and the direct and indirect introduction of pollutants into water resources.

In one peer-reviewed study, commissioned by the Kansas Legislature and conducted in collaboration with the U.S. Geological Survey and U.S. Bureau of Reclamation, the Kansas Geological Survey examined six sand and gravel pits to determine the impact of surface water infiltration on groundwater quality. The study found that gravel mining operations create direct pathways for contaminant transport into

groundwater systems.[8] The Kansas study demonstrated that "stormwater runoff containing contaminants enters ground water through the sand pits and impacts ground-water quality."[9] Researchers installed monitoring wells both upgradient and downgradient from the pits, enabling them to establish clear causal relationships between surface contamination and groundwater quality degradation. Twenty-one different pesticides and degradation compounds infiltrated groundwater through the exposed gravel pits, with contamination transport patterns clearly traceable to the mining operations. The study found that "concentrations of pesticides and degradates were usually higher in downgradient well waters than in upgradient well waters and were usually highest in the southeast well (in the general direction of ground-water flow)."[10]

Similarly, researchers in Hancock County, Maine, linked gravel mining to increased vulnerability of aquifers to contamination by chloride and nitrate.[11] Their study surmised that shorter flow paths created by mining activities increase the susceptibility of the aquifer to contamination as water can carry pollutants more directly into the aquifer without the natural filtration that longer flow paths provide. Gravel mines facilitate this by imposing changes to the land surface affecting how water flows and recharges the aquifer. This alteration can create depressions that redirect water flow, increasing the aquifer's vulnerability to contamination. At the same time, the removal of the organic soil layer diminishes the soil's ability to filter out pollutants, making it easier for contaminants to reach the aquifer.

Summary of Key Environmental Impacts of Gravel Mining on Water Resources

Water Resource	Primary Impact Category	Key Effects
Groundwater	Quantity Reduction	Lowered water tables, reduced drinking water availability, drying of wells, land subsidence.
	Quality Degradation	Increased turbidity, chemical contamination, altered temperature, intermixing of aquifers.

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[8] Donald Whittemore, *Stormwater Runoff into Sand Pits—Effects on Ground-Water Quality*, Kan. Geological Survey, Pub. Info. Circular No. 29 (Aug. 2009), https://www.kgs.ku.edu/Publications/PIC/pic29.html.

[9] Whittemore, Stormwater Runoff into Sand Pits (2009)

[10] Id.

[11] J.M. Peckenham et al., Sand and Gravel Mining: Effects on Ground Water Resources in Hancock County, Maine, USA, 56 *Envtl. Geol.* 1103 (2009), https://doi.org/10.1007/s00254-008-1210-7.

Waterways	Hydrological Alteration	Channel incision, bed degradation, bank erosion, altered flow patterns, "hungry water" effects.
(Rivers, Streams, Lakes)	Quality Degradation	Increased turbidity, suspended solids, chemical pollution, thermal changes, potential acid mine drainage.
	Habitat & Biota Loss	Destruction of spawning/rearing habitats, food web disruption, species shifts, migration blockages.
Wetlands	Habitat Destruction	Direct removal of vegetation, fragmentation, disruption of natural habitats.
	Hydrological Alteration	Altered water regimes, reduced wetted periods, interruption of natural recharge.
	Biodiversity Loss	Displacement of native species, disruption of ecosystem processes, introduction of invasive species.

2. Documented Air Quality Degradation and Hazardous Noise Levels Threaten Public Health

Gravel mining and gravel pits significantly impact air quality, primarily through the emission of particulate matter and other pollutants. Mineralogical and geochemical analysis of dust from sand and gravel quarries has revealed that a substantial portion of airborne particles are respirable, posing potential health risks.[12] These activities contribute to elevated levels of suspended particulate matter, including PM10 and PM2.5.[13]

At the same time, significant environmental and public health risks are associated with the increase in heavy vehicle traffic. The increased presence of these massive

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[12] Menhaje-Bena et al., Airborne dust particles originated from sand and gravel quarries (2023) https://doi.org/10.21203/rs.3.rs-3148651/v1.

[13] *See* Nagaraja et al., Environmental Impact Assessment of Air Quality Issues Caused by the Granite Quarrying and Stone Processing Industry in Ramanagara District, Karnataka State, India. 24 *Nature Environment and Pollution Technology* 41. (2025) https://doi.org/10.46488/nept.2024.v24is1.003; C.-T. Chang et al., Fugitive Dust Emission Source Profiles and Assessment of Selected Control Strategies for Particulate Matter at Gravel Processing Sites in Taiwan. 60 *Journal of The Air & Waste Management Association* 1262 (2010), https://doi.org/10.3155/1047-3289.60.10.1262.

laden vehicles leads to a considerable increase in harmful pollutants such as NO2, PM2.5 and PM10 that exacerbate health risks for residents, particularly children.[14]

Noise pollution from gravel operations consistently exceeds safe thresholds. A substantial portion of miners are exposed to noise levels that exceed recommended safety limits, often leading to hearing loss and other health issues. One study found that a significant number of sand and gravel miners are exposed to noise levels exceeding the recommended limits.[15] Specifically, 69% of workers had noise exposures above the NIOSH recommended exposure limit, and 41% exceeded the MSHA action level for hearing conservation program enrollment. Hearing impairment was prevalent among the miners, with 37% of the subjects showing signs of hearing loss as defined by NIOSH criteria.

Mine dust pollution is considered a major threat to surface vegetation and landscapes, including agriculture.[16] When dust settles on the leaves of trees, it "suffocates" them, making them increasingly less productive and less healthy. The dust particles physically obstruct the leaves' stomata—the tiny openings crucial for gas exchange—thereby hindering vital physiological processes such as photosynthesis, light interception, nutrient availability, and gas-energy exchange.[17] This directly reduces the plant's ability to capture carbon dioxide and release oxygen, leading to a measurable reduction in carbon uptake and transpiration. Beyond vegetation, mine dust can also contaminate surrounding rivers, farmlands, and crops, posing risks to domestic water and food security.

3. Scientific Evidence Establishes Mining's Permanent Ecological Impacts

The proposed 238-acre mining operation would inflict irreversible ecological damage to a landscape where environmental recovery consistently fails to achieve restoration to reference conditions. Scientific evidence demonstrates that mining activities fundamentally alter ecosystem structure and function in ways that persist indefinitely, making any claimed restoration inadequate protection against the very serious consequences.

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[14] Reza Ziarati et al., The Impact of Quarrying Activities on Air Quality and Public Health: A Case Study in Warwickshire. *Science Journal of Public Health*, *12*(6), 212 (2024), https://doi.org/10.11648/j.sjph.20241206.15.

[15] Deborah Landen et al., Noise exposure and hearing loss among sand and gravel miners. 1(8) J. Occup. Env't Hyg. 532 (2004), https://doi.org/10.1080/15459620490476503.

[16] Haoxuan Yu et al.. Environmental hazards posed by mine dust, and monitoring method of mine dust pollution using remote sensing technologies: An overview, *Sci. Total Env't* 864, 161135 (2023), https://doi.org/10.1016/j.scitotenv.2022.161135.

[17] A. K. Ranjan et al., A new approach for prediction of foliar dust in a coal mining region and its impacts on vegetation physiological processes using multi-source satellite data sets. 129 *Journal of Geophysical Research: Biogeosciences* (2024), https://doi.org/10.1029/2024JG008298.

Gravel mining causes severe habitat destruction with restoration success rates that never achieve full ecological recovery. Scientific studies demonstrate that restored mining sites remain thirteen percent below reference ecosystem biodiversity levels even after extensive rehabilitation efforts.[18] The temporal dimension of restoration failure proves particularly significant for regulatory analysis. Even assuming restoration efforts achieve their maximum potential effectiveness, a generous assumption contradicted by scientific evidence, the ecological functions lost during active mining operations remain permanently eliminated. For wetland-dependent species with limited mobility and specific habitat requirements, temporary habitat destruction equates to permanent population loss.

The proposed mining operation would eliminate wetland habitat precisely when such resources have become most scarce and ecologically valuable. Michigan's wetland resources represent critical infrastructure for statewide biodiversity conservation. The state's remaining 5.5 million acres of wetlands constitute only half the wetlands that existed prior to European settlement, making each remaining wetland acre increasingly valuable for ecosystem stability. "While state wetland regulations have helped to slow the destruction of wetlands in Michigan from a quantitative perspective, watershed related wetland studies completed around the State have consistently shown a decrease in wetland function and overall quality for the wetlands that remain."[19]

Within this context, forty-one of Michigan's listed threatened and endangered animal species depend directly on wetland habitats, while forty-nine percent of the state's rare plant species require wetland conditions for survival. The loss of these ecosystems not only diminishes biodiversity but also disrupts the ecological processes that sustain various life forms, leading to cascading effects throughout the food web.[20]

The applicant's designation of 184 acres as "preservation areas" provides no meaningful offset for the ecological destruction within the 238-acre mining footprint. These preservation areas consist primarily of existing wetlands that already provide established ecosystem services to the regional environment. Maintaining existing ecological functions cannot compensate for the active elimination of additional functional wetland systems.

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[18] Joe Atkinson et al., Terrestrial ecosystem restoration increases biodiversity and reduces its variability, but not to reference levels: A global meta-analysis, 25(7) Ecol Lett. 1725 (2022), https://doi.org/10.1111/ele.14025.

[19] Michigan Department of Environmental Quality, Status and Trends of Michigan's Wetlands: Pre-European Settlement to 2005 (2014).

[20] A. Brautigam, *The freshwater biodiversity crisis. 2*, 4–5 (1999), https://pubmed.ncbi.nlm.nih.gov/12349584/.

Moreover, preservation areas adjacent to active mining operations experience significant degradation through edge effects, dust deposition, hydrological alteration, and noise disturbance. Scientific research documents substantial ecosystem degradation extending well beyond the direct footprint of mining activities, meaning that even the designated preservation areas would suffer measurable ecological impairment.[21]

Wetlands deliver quantifiable ecosystem services that mining operations cannot replicate through engineered alternatives. These natural systems provide critical water quality enhancement through filtration processes that remove pollutants and excess nutrients from water systems, particularly vital in areas where agricultural runoff threatens water quality.[22] The destruction of wetland filtering capacity within the mining area would permanently compromise water quality protection for downstream communities. They also contribute significantly to local economies through services such as water supply and recreational opportunities, underscoring their value beyond ecological functions.[23]

Wetlands also serve as vital buffers against climate change, acting as carbon sinks that mitigate greenhouse gas emissions.[24] The preservation of these ecosystems is not merely an environmental issue but a critical component of climate resilience strategies, as they provide essential services that help communities adapt to changing conditions, such as increased flooding and droughts. Furthermore, the degradation of wetlands can lead to substantial losses in these services, emphasizing the need for informed decision-making that considers the full spectrum of benefits wetlands offer, including their role in flood regulation and climate adaptation.[25,26]

The economic valuation of wetlands often underrepresents their true worth, as many of the ecosystem services they provide are not captured in traditional market frameworks. For instance, wetlands are instrumental in regulating local climates and enhancing resilience to natural disasters, which can save communities significant costs in disaster recovery and infrastructure repair.[27] Furthermore, the

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[21] See ex. Haoxuan Yu et al.. Environmental hazards posed by mine dust, and monitoring method of mine dust pollution using remote sensing technologies: An overview, *Sci. Total Env't* 864, 161135 (2023), https://doi.org/10.1016/j.scitotenv.2022.161135.
[22] Dolf de Groot et al., Wetland Ecosystem Services, in *Encyclopedia of Ecology* (2018), https://doi.org/10.1007/978-90-481-9659-3_66.
[23] Alexandra Dehnhardt et al., Valuation of Wetlands Preservation (2019), https://doi.org/10.1093/acrefore/9780199389414.013.457.
[24] A.J. Stewart et al., Revealing the hidden carbon in forested wetland soils. *Nat Commun* 15, 726 (2024). https://doi.org/10.1038/s41467-024-44888-x
[25] Dehnhardt et al., (2019).
[26] Arunima Nayak et al., *Wetland Ecosystems and Their Relevance to the Environment* (2022), https://doi.org/10.4018/978-1-7998-9498-8.ch001.
[27] Dehnhardt et al., (2019).

recreational potential of wetlands—ranging from birdwatching to fishing—serves not only to enrich local culture but also to attract tourism, thereby generating income for surrounding areas.[28]

The permanent destruction of wetland ecosystems, irreversible biodiversity loss, and elimination of critical ecosystem services satisfy every criterion for denying the mining permit based on ecological impacts alone.

D. Property Values Suffer Permanent and Substantial Losses Near Gravel Operations

The applicant has failed to rebut overwhelming economic evidence that gravel operations cause catastrophic and permanent property value destruction. The presence of gravel mines creates an environment that deters potential buyers and investors from considering properties in the area, thereby perpetuating a cycle of devaluation and disinvestment.

In a 2016 report assessing the economic impact of a proposed gravel mine in Richland Township, MI, researchers estimated that properties within three miles of the project were likely to experience a marked reduction in value, with a half-mile distance leading to an estimated 20 percent decline, one mile to about 14.5 percent, two miles to roughly an 8.9 percent reduction, and three miles to nearly a 4.9 percent drop in value.[29] Through a simulation study focusing on Richland Village and Richland Township, researchers found that more than 1,400 homes would be adversely affected by the proposed mine, leading to an estimated total loss in property value of approximately $31.5 million.

A study of 2,812 properties in Delaware County, Ohio further highlights the tangible economic implications for residents.[30] The analysis found that homes situated within half a mile of an operational gravel pit experienced an average loss of value of 36% when compared to those between 0.5 to 5 miles away. The value of homes within 1.5 miles of the gravel pit were 25% lower than those between 1.5 to 5 miles away. These property value impacts are permanent and persist over time, with uncertainty about future development creating additional downward pressure on real estate values.

The decrease in property values is not just a monetary loss to homeowners. It represents the deterioration in the quality of life for those living near the mine. In

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[28] D.W. Marcouiller et al, The Regional Supply of Outdoor Recreation Resources..., 27(4) *J. Park & Recreation Admin.* (2009), https://js.sagamorepub.com/jpra/article/view/1274.
[29] George A. Erickcek, An Assessment of the Economic Impact of the Proposed Stoneco Gravel Mine Operation on Richland Township (2006), https://research.upjohn.org/reports/222.
[30] Diane Hite, Summary of Analysis: Impact of an Operational Gravel Pit on House Values in Delaware County, Ohio (2006).

simple terms, as houses lose value, this loss indicates that the local environment and neighborhood are less desirable due to the mine's negative impacts. A sustained decline in property values in areas adjacent to gravel mines may lead to reduced tax revenues for local governments, subsequently impacting public services such as education and infrastructure maintenance. Additionally, as residents become disillusioned with their living conditions, there may be an increase in out-migration, further exacerbating economic challenges in these regions. This phenomenon is particularly significant in rural areas, where economic development often hinges on maintaining a stable and engaged population.[31]

These economic impacts constitute "very serious consequences" that the applicant cannot rebut through unsupported assertions of economic benefit. The law permits consideration of impacts "on property values in the vicinity," and the evidence establishes devastating and permanent harm.

IV. Township Possesses Clear Constitutional Authority for Superior Economic Use Through Eminent Domain

The township possesses clear constitutional authority to acquire the subject property through eminent domain for wetland restoration purposes. The Fifth Amendment's Takings Clause, applied to local governments through the Fourteenth Amendment, permits condemnation when two essential elements converge: the taking serves public use and just compensation is provided.

Law in the United States has long recognized both the legality and necessity for governments to pursue condemnation for environmental purposes, recognizing that ecological preservation constitutes a fundamental public benefit transcending individual property interests.[32] One of the earliest such examples can be found in an 1888 federal statute authorizing the then-Secretary of War to condemn land or public buildings for the maintaining and improvement of rivers and harbors.[33] Wetland restoration unquestionably satisfies the public use requirement under both traditional and modern interpretations. The Supreme Court's decision in *Kelo v. City of New London* (2005) expanded public use to encompass public purpose. More fundamentally, wetland restoration serves multiple established public purposes: flood control, water quality protection, habitat preservation, and climate resilience, each independently sufficient to justify eminent domain action.

Economic analysis demonstrates that preserving property for wetland ecosystem services and recreational development generates superior long-term economic

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[31] Miranda N. Smith et al., *How Migration Impacts Rural America*, Univ. of Wis. Madison (2016).
[32] Silver Creek Drain Dist. v. Extrusions Div., Inc., 468 Mich. 367, 663 N.W.2d 436 (2003).
[33] Act of Apr. 24, 1888, ch. 194, 25 Stat. 94.

returns compared to extractive use.[34] The economic value of the ecosystem services provided by wetlands is substantial. Nationwide, the cumulative ecosystem services value derived from wetlands can range from $5,000 to $70,000 per acre per year.[35] The traditional perception of wetlands as unproductive or challenging land is therefore fundamentally flawed; they are, in fact, critical natural infrastructure that provides quantifiable economic benefits far beyond their direct ecological value. This means that investing in wetland preservation and expansion is not merely an environmental expenditure but a strategic economic investment that enhances community resilience, reduces future costs, and creates new revenue streams, positioning wetlands as vital economic infrastructure.

Wetland mitigation banking represents a significant opportunity for direct revenue generation. This concept involves the restoration or creation of wetlands in advance of authorized impacts, leading to the generation of "credits" that can be sold to entities—such as businesses, landowners, or public agencies—that are required to offset unavoidable wetland losses resulting from their development projects.[36] The revenue potential from wetland mitigation banking is substantial. Commercial wetland mitigation credits in Michigan typically range from $100,000 to $150,000 per acre-credit.[37]

Developing the property into an eco-tourism and outdoor recreation hub offers significant economic benefits through visitor spending, job creation, and increased property values. The property's existing wetlands are prime locations for activities such as birdwatching, general wildlife viewing, and non-motorized boating. Restored or constructed wetlands on the remaining acreage can be designed with aesthetic enhancements like walking paths, gazebos, and bird houses to further boost visitor appeal.

Public ownership ensures open access to diverse recreational activities, promoting physical activity and mental well-being for residents. Developing a comprehensive multi-use trail system across the property can connect various natural features and provide year-round recreational opportunities. Trails provide low-cost recreation infrastructure and encourage healthier lifestyles, leading to reduced healthcare costs. Studies suggest that a one-dollar investment in trails can lead to approximately three dollars in medical savings per person. [38]

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[34] Restore America's Estuaries, Jobs and Dollars: Big Returns from Coastal Habitat Restoration (2025); see also Restore America's Estuaries, The Economic Value of America's Estuaries (2021).
[35] Naveen Adusumilli, Valuation of Ecosystem Services from Wetlands Mitigation in the United States. 4 *Land* 182 (2015), https://doi.org/10.3390/land4010182.
[36] Mich. Admin. Code r. 281.951–961.
[37] Michigan Wetland Board, www.miwb.org.
[38] Bob Wilson & Anna Lee, Trail Building Law and Policy: A Michigan Manual (2024).

The aesthetic and recreational enhancements from eco-tourism development directly translate into increased property values for adjacent and nearby homes. This generates significant wealth for residents and increases the local tax base, representing a powerful indirect economic benefit. The increase in property values directly benefits homeowners through increased equity and wealth, and the municipality through increased property tax revenue. Higher property values also make the area more attractive for new residents and businesses. The aesthetic and recreational amenities of an eco-tourism hub create a positive feedback loop: attractive natural spaces lead to higher property values, which in turn generate more tax revenue for the municipality, allowing for further investment in public services and amenities, enhancing the overall economic vitality and quality of life for residents.

The diverse job opportunities created by these land uses, particularly those accessible without advanced degrees, directly address the human capital needs of rural Michigan. This fosters local skill development, helps retain residents, and builds a more resilient community workforce. These job opportunities provide direct income to residents and contribute to local spending. More importantly, they offer career pathways within the rural community, preventing out-migration and building local expertise. This focus on accessible job creation transforms the land project into a powerful tool for rural workforce development and community retention. It means "profitability" is not just about municipal revenue but about the sustained economic vitality and social fabric of the community, making it a more attractive place to live and work for future generations.

V. Conclusion

Edw. C. Levy Co. cannot establish genuine market need when its claims rest on demonstrably corrupted state analysis orchestrated by its own executive leadership. The company cannot prove that no very serious consequences would result when peer-reviewed scientific research establishes that gravel mining operations systematically contaminate groundwater, destroy irreplaceable wetland ecosystems, and cause permanent property value losses exceeding $31 million in comparable communities. Most fundamentally, an operator with seventeen citations for "unreasonable interference with the comfortable enjoyment of life and property" at a single facility cannot credibly claim it will operate without causing very serious consequences to Springfield Township residents.

Where state regulators have abdicated their responsibility to consider operator compliance history, this Commission serves as the final guardian of community welfare. The choice transcends a single permit application—it represents whether

local communities retain meaningful authority to protect their residents from industrial operators with documented patterns of environmental destruction.

Thank you in advance for your consideration and please feel free to reach out if we can provide you with any additional information.

/s/Andrew Bashi

Andrew Bashi (P84433)

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Ric Davis

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Friday, June 20, 2025 12:12 PM
To: Ric Davis; Julia Upfal; Stephanie Osborn
Cc: Green, Tom; Katy A. Lindstrom; Deciechi, Kayla; Fran Thompson; Stephen R. Estey; Irit Walters; Bob Doyle
Subject: [EXTERNAL] Ormond Road Field Monitoring Well Data
Attachments: Field Monitoring Well Data 250618(26).pdf

Dear Supervisor Davis, Julia, and Stephanie,

It was brought to my attention that the monitoring well raw data inadvertently had not been shared with you. Attached to this email, please find that data. Please let us know if you are pending any further data from us.

Thank you,
Reuben

Field Monitoring Well Water Elevation Data Over Time

Well #	#1		#2		#3		#4		#5		#6		#7		#8		#9	
Y	450672.2		448238.3		448206.4		449413.1		446166.0		450618.5		449801.5		449479.2		449464.5	
X	13342207.9		13342355.8		13340470.4		13338904.2		13341535.1		13338253.7		13336907.4		13338227.6		13338910.0	
Ground Elev. (ft)	1104.7		1081.8		1069.4		1016.8		1066.7		1021.2		993.4		997.2		1020.4	
T.O.C. Elev. (ft)	1107.7		1084.7		1072.4		1021.5		1069.9		1024.1		998.1		1003.5		1024.0	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
11/21/2008	90.7	1017.0	68.9	1015.8	57.6	1014.8	10.5	1010.9	53.8	1016.1	NM	--	NM	--	NM	--	NM	--
12/14/2008	90.8	1016.9	69.0	1015.7	57.7	1014.7	10.4	1011.1	53.9	1016.0	NM	--	NM	--	NM	--	NM	--
1/3/2009	90.9	1016.8	69.1	1015.6	57.7	1014.8	6.3	1015.1	53.8	1016.1	NM	--	NM	--	NM	--	NM	--
2/20/2009	90.9	1016.8	68.9	1015.9	57.3	1015.1	6.2	1015.2	53.5	1016.5	NM	--	NM	--	NM	--	NM	--
3/14/2009	90.7	1016.9	68.6	1016.2	57.0	1015.5	4.8	1016.6	53.0	1016.9	NM	--	NM	--	NM	--	NM	--
4/18/2009	90.3	1017.3	67.9	1016.9	56.2	1016.2	6.9	1014.6	52.2	1017.8	NM	--	NM	--	NM	--	NM	--
5/23/2009	89.9	1017.8	67.0	1017.8	55.2	1017.3	8.0	1013.5	51.0	1019.0	NM	--	NM	--	NM	--	NM	--
6/16/2009	89.4	1018.2	66.2	1018.5	54.6	1017.8	10.3	1011.2	50.6	1019.3	NM	--	NM	--	NM	--	NM	--
7/12/2009	88.9	1018.7	65.7	1019.0	54.4	1018.0	11.0	1010.5	50.6	1019.3	NM	--	NM	--	NM	--	NM	--
8/29/2009	88.2	1019.5	65.7	1019.0	54.7	1017.7	11.9	1009.5	51.1	1018.9	NM	--	NM	--	NM	--	NM	--
9/20/2009	88.0	1019.6	66.0	1018.8	54.9	1017.5	12.5	1009.0	51.3	1018.6	NM	--	NM	--	NM	--	NM	--
10/26/2009	87.9	1019.8	66.3	1018.4	55.3	1017.2	12.8	1008.7	51.7	1018.3	NM	--	NM	--	NM	--	NM	--
11/13/2009	87.9	1019.7	66.5	1018.3	55.4	1017.0	12.8	1008.6	51.8	1018.1	NM	--	NM	--	NM	--	NM	--
12/22/2009	88.2	1019.5	66.9	1017.8	55.8	1016.7	12.2	1009.3	52.1	1017.8	NM	--	NM	--	NM	--	NM	--
1/10/2010	88.3	1019.4	67.1	1017.7	55.9	1016.5	11.4	1010.0	52.3	1017.7	NM	--	NM	--	NM	--	NM	--
2/2/2010	88.4	1019.2	67.3	1017.5	56.1	1016.3	10.0	1011.4	52.4	1017.5	NM	--	NM	--	NM	--	NM	--
3/27/2010	88.7	1018.9	67.6	1017.1	56.4	1016.1	8.3	1013.2	52.6	1017.3	NM	--	NM	--	NM	--	NM	--
4/24/2010	89.0	1018.7	67.7	1017.0	56.4	1016.1	9.2	1012.3	52.6	1017.4	NM	--	NM	--	NM	--	NM	--
5/29/2010	89.1	1018.6	67.7	1017.1	56.2	1016.2	9.2	1012.3	52.4	1017.6	NM	--	NM	--	NM	--	NM	--
6/30/2010	89.2	1018.4	67.7	1017.1	56.3	1016.2	10.7	1010.8	52.5	1017.5	NM	--	NM	--	NM	--	NM	--
7/31/2010	89.3	1018.4	67.8	1016.9	56.5	1016.0	11.2	1010.3	52.7	1017.2	NM	--	NM	--	NM	--	NM	--
8/20/2010	89.4	1018.3	67.9	1016.8	56.6	1015.9	11.5	1010.0	52.9	1017.0	NM	--	NM	--	NM	--	NM	--
9/26/2010	89.6	1018.0	68.3	1016.5	57.0	1015.4	12.2	1009.2	53.4	1016.6	NM	--	NM	--	NM	--	NM	--
10/23/2010	89.8	1017.8	68.5	1016.2	57.2	1015.2	12.6	1008.8	53.6	1016.4	NM	--	NM	--	NM	--	NM	--
11/29/2010	90.0	1017.6	68.8	1015.9	57.5	1014.9	13.1	1008.4	53.9	1016.1	NM	--	NM	--	NM	--	NM	--
12/29/2010	90.1	1017.5	68.9	1015.8	57.7	1014.8	13.2	1008.3	54.0	1015.9	NM	--	NM	--	NM	--	NM	--
1/8/2011	90.2	1017.4	69.0	1015.7	57.8	1014.7	13.2	1008.3	54.2	1015.8	NM	--	NM	--	NM	--	NM	--
2/20/2011	90.5	1017.1	69.3	1015.4	58.1	1014.4	11.5	1009.9	54.4	1015.6	NM	--	NM	--	NM	--	NM	--
3/19/2011	90.8	1016.9	69.4	1015.3	58.0	1014.4	6.5	1015.0	54.3	1015.6	NM	--	NM	--	NM	--	NM	--
4/30/2011	90.9	1016.7	69.2	1015.5	57.7	1014.7	4.4	1017.1	53.8	1016.1	NM	--	NM	--	NM	--	NM	--
5/22/2011	90.8	1016.8	68.8	1015.9	57.2	1015.3	6.1	1015.4	53.1	1016.9	NM	--	NM	--	NM	--	NM	--
6/26/2011	90.5	1017.2	68.0	1016.8	56.3	1016.2	6.6	1014.9	52.2	1017.7	NM	--	NM	--	NM	--	NM	--
7/19/2011	90.2	1017.4	67.6	1017.2	56.1	1016.3	10.5	1011.0	52.3	1017.7	NM	--	NM	--	NM	--	NM	--
8/20/2011	89.9	1017.7	67.4	1017.4	56.1	1016.3	10.9	1010.5	52.3	1017.6	NM	--	NM	--	NM	--	NM	--
9/25/2011	89.7	1018.0	67.5	1017.2	56.3	1016.1	11.4	1010.0	52.6	1017.4	NM	--	NM	--	NM	--	NM	--

Field Monitoring Well Water Elevation Data Over Time

Well #	#1		#2		#3		#4		#5		#6		#7		#8		#9	
Y	450672.2		448238.3		448206.4		449413.1		446166.0		450618.5		449801.5		449479.2		449464.5	
X	13342207.9		13342355.8		13340470.4		13338904.2		13341535.1		13338253.7		13336907.4		13338227.6		13338910.0	
Ground Elev. (ft)	1104.7		1081.8		1069.4		1016.8		1066.7		1021.2		993.4		997.2		1020.4	
T.O.C. Elev. (ft)	1107.7		1084.7		1072.4		1021.5		1069.9		1024.1		998.1		1003.5		1024.0	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
10/28/2011	89.6	1018.1	67.7	1017.1	56.5	1015.9	11.1	1010.4	52.8	1017.2	NM	--	NM	--	NM	--	NM	--
11/26/2011	89.6	1018.0	67.9	1016.9	56.7	1015.8	10.6	1010.9	52.9	1017.0	NM	--	NM	--	NM	--	NM	--
12/26/2011	89.6	1018.0	67.9	1016.8	56.6	1015.8	6.3	1015.1	52.9	1017.1	NM	--	NM	--	NM	--	NM	--
1/11/2012	89.7	1018.0	67.9	1016.8	56.6	1015.8	8.3	1013.2	52.8	1017.1	NM	--	NM	--	NM	--	NM	--
2/5/2012	89.7	1017.9	68.0	1016.8	56.6	1015.8	7.1	1014.4	52.8	1017.2	NM	--	NM	--	NM	--	NM	--
3/17/2012	89.6	1018.0	67.8	1016.9	56.4	1016.1	8.0	1013.4	52.5	1017.4	NM	--	NM	--	NM	--	NM	--
4/25/2012	89.5	1018.2	67.6	1017.2	56.2	1016.3	10.5	1011.0	52.3	1017.6	NM	--	NM	--	NM	--	NM	--
5/30/2012	89.4	1018.2	67.5	1017.3	56.1	1016.4	10.6	1010.9	52.2	1017.7	NM	--	NM	--	NM	--	NM	--
6/16/2012	89.4	1018.3	67.5	1017.3	56.2	1016.3	10.9	1010.6	52.4	1017.5	NM	--	NM	--	NM	--	NM	--
7/28/2012	89.5	1018.1	67.8	1016.9	56.6	1015.9	11.5	1010.0	53.0	1017.0	NM	--	NM	--	NM	--	NM	--
8/19/2012	89.6	1018.1	68.0	1016.8	56.8	1015.7	11.2	1010.3	53.2	1016.8	NM	--	NM	--	NM	--	NM	--
9/28/2012	89.8	1017.8	68.3	1016.4	57.2	1015.3	12.0	1009.4	53.6	1016.4	NM	--	NM	--	NM	--	NM	--
10/28/2012	90.0	1017.7	68.6	1016.1	57.4	1015.0	12.3	1009.2	53.8	1016.1	NM	--	NM	--	NM	--	NM	--
11/27/2012	90.1	1017.6	68.9	1015.9	57.6	1014.8	12.4	1009.0	54.0	1015.9	NM	--	NM	--	NM	--	NM	--
12/26/2012	90.3	1017.4	69.1	1015.7	57.8	1014.6	10.8	1010.7	54.2	1015.7	NM	--	NM	--	NM	--	NM	--
1/19/2013	90.5	1017.2	69.3	1015.5	58.0	1014.4	7.4	1014.1	54.3	1015.6	NM	--	NM	--	NM	--	NM	--
2/17/2013	90.7	1017.0	69.3	1015.4	58.0	1014.5	8.2	1013.3	54.3	1015.7	NM	--	NM	--	NM	--	NM	--
3/17/2013	90.9	1016.8	69.2	1015.5	57.8	1014.7	7.3	1014.2	54.1	1015.9	NM	--	NM	--	NM	--	NM	--
4/28/2013	90.9	1016.7	69.0	1015.7	57.5	1015.0	6.1	1015.3	53.6	1016.4	NM	--	NM	--	NM	--	NM	--
5/25/2013	90.9	1016.8	68.7	1016.1	57.1	1015.4	9.8	1011.6	53.2	1016.8	NM	--	NM	--	NM	--	NM	--
6/30/2013	90.7	1017.0	68.4	1016.4	56.9	1015.5	7.3	1014.2	53.0	1016.9	NM	--	NM	--	NM	--	NM	--
7/21/2013	90.6	1017.1	68.3	1016.5	56.8	1015.7	9.0	1012.4	53.0	1017.0	NM	--	NM	--	NM	--	NM	--
8/31/2013	90.4	1017.3	68.1	1016.6	56.8	1015.7	10.6	1010.8	53.0	1017.0	NM	--	NM	--	NM	--	NM	--
9/28/2013	90.3	1017.3	68.2	1016.5	57.0	1015.5	11.2	1010.2	53.2	1016.7	NM	--	NM	--	NM	--	NM	--
10/29/2013	90.3	1017.3	68.4	1016.3	57.2	1015.3	11.7	1009.8	53.5	1016.5	NM	--	NM	--	NM	--	NM	--
11/14/2013	90.4	1017.3	68.5	1016.2	57.3	1015.2	11.8	1009.6	53.6	1016.4	NM	--	NM	--	NM	--	NM	--
12/30/2013	90.5	1017.1	68.8	1015.9	57.6	1014.9	11.6	1009.9	53.9	1016.1	NM	--	NM	--	NM	--	NM	--
1/31/2014	90.0	1017.6	69.1	1015.7	57.8	1014.6	10.8	1010.6	54.1	1015.9	NM	--	NM	--	NM	--	NM	--
2/15/2014	90.8	1016.9	69.1	1015.6	57.9	1014.5	11.1	1010.4	54.2	1015.8	NM	--	NM	--	NM	--	NM	--
3/23/2014	90.9	1016.7	69.3	1015.4	58.0	1014.5	5.0	1016.4	54.3	1015.6	NM	--	NM	--	NM	--	NM	--
4/13/2014	90.9	1016.7	69.1	1015.7	56.6	1015.8	7.3	1014.2	53.8	1016.1	NM	--	NM	--	NM	--	NM	--
5/31/2014	90.7	1017.0	68.5	1016.2	56.9	1015.6	8.6	1012.9	52.8	1017.1	NM	--	NM	--	NM	--	NM	--
6/27/2014	90.5	1017.2	68.1	1016.7	56.5	1015.9	10.2	1011.3	52.6	1017.3	NM	--	NM	--	NM	--	NM	--
7/31/2014	90.2	1017.4	67.8	1017.0	56.5	1015.9	10.9	1010.6	52.7	1017.3	NM	--	NM	--	NM	--	NM	--
8/29/2014	90.1	1017.6	67.8	1017.0	56.6	1015.9	11.4	1010.1	52.9	1017.1	NM	--	NM	--	NM	--	NM	--

Field Monitoring Well Water Elevation Data Over Time

Well #	#1		#2		#3		#4		#5		#6		#7		#8		#9	
Y	450672.2		448238.3		448206.4		449413.1		446166.0		450618.5		449801.5		449479.2		449464.5	
X	13342207.9		13342355.8		13340470.4		13338904.2		13341535.1		13338253.7		13336907.4		13338227.6		13338910.0	
Ground Elev. (ft)	1104.7		1081.8		1069.4		1016.8		1066.7		1021.2		993.4		997.2		1020.4	
T.O.C. Elev. (ft)	1107.7		1084.7		1072.4		1021.5		1069.9		1024.1		998.1		1003.5		1024.0	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
9/30/2014	90.0	1017.7	68.0	1016.8	56.8	1015.7	10.6	1010.9	53.0	1016.9	NM	--	NM	--	NM	--	NM	--
10/29/2014	90.0	1017.7	68.1	1016.6	56.9	1015.5	11.1	1010.3	53.2	1016.8	NM	--	NM	--	NM	--	NM	--
11/29/2014	90.0	1017.6	68.3	1016.5	57.0	1015.4	9.2	1012.3	53.3	1016.6	NM	--	NM	--	NM	--	NM	--
12/7/2014	90.1	1017.5	68.4	1016.4	57.1	1015.3	10.2	1011.2	53.4	1016.6	NM	--	NM	--	NM	--	NM	--
1/16/2015	90.3	1017.4	68.6	1016.2	57.3	1015.1	10.4	1011.1	53.5	1016.4	NM	--	NM	--	NM	--	NM	--
2/1/2015	90.3	1017.4	68.6	1016.1	57.3	1015.1	10.4	1011.0	53.6	1016.3	NM	--	NM	--	NM	--	NM	--
3/21/2015	90.5	1017.1	68.6	1016.1	57.2	1015.2	8.5	1013.0	53.6	1016.4	NM	--	NM	--	NM	--	NM	--
4/19/2015	90.5	1017.1	68.7	1016.1	57.3	1015.1	9.5	1011.9	53.5	1016.4	NM	--	NM	--	NM	--	NM	--
5/22/2015	90.7	1017.0	68.8	1015.9	57.4	1015.0	10.9	1010.6	53.6	1016.4	NM	--	NM	--	NM	--	NM	--
6/28/2015	90.8	1016.9	68.9	1015.9	57.5	1015.0	10.0	1011.4	53.5	1016.4	NM	--	NM	--	NM	--	NM	--
7/31/2015	90.8	1016.8	69.0	1015.8	57.5	1014.9	11.3	1010.2	53.7	1016.2	NM	--	NM	--	NM	--	NM	--
8/28/2015	90.9	1016.8	69.1	1015.7	57.7	1014.7	12.0	1009.4	54.0	1016.0	NM	--	NM	--	NM	--	NM	--
9/7/2015	90.9	1016.7	69.1	1015.6	57.8	1014.7	12.3	1009.2	54.0	1015.9	NM	--	NM	--	NM	--	NM	--
10/30/2015	91.1	1016.5	69.5	1015.2	58.2	1014.3	13.0	1008.4	54.5	1015.5	NM	--	NM	--	NM	--	NM	--
11/29/2015	91.3	1016.4	69.7	1015.0	58.4	1014.1	13.0	1008.5	54.7	1015.3	NM	--	NM	--	NM	--	NM	--
12/26/2015	91.4	1016.3	69.8	1014.9	58.5	1013.9	12.8	1008.7	54.8	1015.2	NM	--	NM	--	NM	--	NM	--
1/3/2016	91.4	1016.2	69.9	1014.8	58.6	1013.9	11.8	1009.6	54.8	1015.1	NM	--	NM	--	NM	--	NM	--
2/7/2016	91.6	1016.1	70.1	1014.7	58.7	1013.7	9.8	1011.6	54.9	1015.0	NM	--	NM	--	NM	--	NM	--
3/19/2016	91.8	1015.8	70.2	1014.5	58.8	1013.7	7.1	1014.4	54.9	1015.0	NM	--	NM	--	NM	--	NM	--
4/16/2016	91.9	1015.7	70.1	1014.7	58.5	1013.9	6.8	1014.6	54.6	1015.4	NM	--	NM	--	NM	--	NM	--
5/26/2016	91.8	1015.9	69.7	1015.1	58.0	1014.4	9.4	1012.0	54.1	1015.9	NM	--	NM	--	NM	--	NM	--
6/30/2016	91.6	1016.0	69.4	1015.4	57.9	1014.6	11.2	1010.3	54.1	1015.9	NM	--	NM	--	NM	--	NM	--
7/28/2016	91.6	1016.1	69.7	1015.0	58.0	1014.5	11.9	1009.6	54.3	1015.7	NM	--	NM	--	NM	--	NM	--
8/31/2016	91.5	1016.2	69.5	1015.3	58.5	1013.9	12.6	1008.9	54.4	1015.5	NM	--	NM	--	NM	--	NM	--
9/8/2016	91.5	1016.2	69.5	1015.2	58.2	1014.3	12.7	1008.8	54.4	1015.5	NM	--	NM	--	NM	--	NM	--
10/25/2016	91.5	1016.1	69.6	1015.1	58.4	1014.1	11.8	1009.7	54.6	1015.4	NM	--	NM	--	NM	--	NM	--
11/28/2016	91.5	1016.1	69.7	1015.0	58.4	1014.1	11.2	1010.3	54.6	1015.3	NM	--	NM	--	NM	--	NM	--
12/10/2016	91.6	1016.0	69.8	1015.0	58.4	1014.0	10.7	1010.7	54.6	1015.3	NM	--	NM	--	NM	--	NM	--
1/14/2017	91.7	1015.9	69.8	1014.9	58.5	1014.0	ABD	ABD	54.7	1015.3	30.3	993.8	16.3	981.8	7.4	996.1	11.0	1013.0
2/5/2017	91.7	1016.0	69.6	1015.2	58.2	1014.3	NM	--	54.4	1015.6	29.9	994.2	15.5	982.5	7.5	996.0	11.9	1012.2
3/5/2017	91.5	1016.1	69.4	1015.4	58.0	1014.5	NM	--	54.1	1015.8	29.6	994.5	13.8	984.3	7.5	996.0	11.5	1012.5
4/16/2017	91.4	1016.3	69.1	1015.6	57.5	1015.0	NM	--	53.4	1016.5	28.6	995.5	10.7	987.4	7.5	996.0	9.6	1014.4
5/27/2017	91.0	1016.7	68.2	1016.5	56.6	1015.8	NM	--	52.6	1017.3	27.9	996.2	12.2	985.8	6.1	997.4	12.0	1012.0
6/11/2017	90.8	1016.9	67.9	1016.8	56.4	1016.0	NM	--	52.5	1017.4	28.0	996.1	13.2	984.9	7.8	995.7	12.7	1011.3
7/21/2017	90.3	1017.3	67.6	1017.1	56.4	1016.0	NM	--	52.7	1017.3	28.4	995.7	14.9	983.1	8.4	995.1	14.0	1010.0

Field Monitoring Well Water Elevation Data Over Time

Well #	#1		#2		#3		#4		#5		#6		#7		#8		#9	
Y	450672.2		448238.3		448206.4		449413.1		446166.0		450618.5		449801.5		449479.2		449464.5	
X	13342207.9		13342355.8		13340470.4		13338904.2		13341535.1		13338253.7		13336907.4		13338227.6		13338910.0	
Ground Elev. (ft)	1104.7		1081.8		1069.4		1016.8		1066.7		1021.2		993.4		997.2		1020.4	
T.O.C. Elev. (ft)	1107.7		1084.7		1072.4		1021.5		1069.9		1024.1		998.1		1003.5		1024.0	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
8/12/2017	90.2	1017.5	67.7	1017.0	56.6	1015.9	NM	--	52.9	1017.0	28.7	995.4	16.1	981.9	8.4	995.1	14.5	1009.5
9/3/2017	90.0	1017.6	67.9	1016.8	56.8	1015.7	NM	--	53.1	1016.8	28.9	995.2	16.9	981.2	8.3	995.2	14.9	1009.1
10/22/2017	90.0	1017.7	68.3	1016.4	57.2	1015.2	NM	--	53.6	1016.3	29.4	994.7	17.9	980.2	8.4	995.1	15.5	1008.5
11/24/2017	90.1	1017.6	68.6	1016.1	57.4	1015.0	NM	--	53.8	1016.2	29.6	994.5	17.7	980.4	8.1	995.4	15.5	1008.5
12/3/2017	90.2	1017.4	68.7	1016.0	57.5	1014.9	NM	--	53.8	1016.1	29.6	994.5	17.8	980.3	8.2	995.3	15.5	1008.5
1/14/2018	90.4	1017.2	69.0	1015.8	57.8	1014.7	NM	--	54.1	1015.8	29.8	994.3	17.4	980.7	8.1	995.4	15.1	1008.9
2/3/2018	90.5	1017.2	69.1	1015.7	57.8	1014.6	NM	--	54.1	1015.8	29.7	994.4	17.0	981.0	8.1	995.4	14.0	1010.0
3/3/2018	90.7	1017.0	68.9	1015.8	57.5	1015.0	NM	--	53.7	1016.3	29.0	995.1	12.5	985.5	7.4	996.1	10.0	1014.0
4/22/2018	90.5	1017.2	68.4	1016.3	56.8	1015.6	NM	--	53.0	1017.0	28.0	996.1	8.0	990.1	7.3	996.2	9.1	1014.9
5/13/2018	90.3	1017.4	68.1	1016.7	56.4	1016.0	NM	--	52.5	1017.4	27.6	996.5	6.8	991.2	7.2	996.3	10.8	1013.3
6/2/2018	90.1	1017.6	67.7	1017.0	56.1	1016.3	NM	--	52.2	1017.7	27.4	996.7	10.7	987.4	7.6	995.9	11.7	1012.3
7/7/2018	89.8	1017.9	67.4	1017.4	56.1	1016.4	NM	--	52.3	1017.6	27.8	996.3	13.7	984.4	8.3	995.2	13.2	1010.8
8/26/2018	89.6	1018.1	67.6	1017.1	56.5	1016.0	NM	--	52.9	1017.1	28.5	995.6	16.4	981.6	8.4	995.1	14.5	1009.5
9/3/2018	89.5	1018.1	67.7	1017.0	56.6	1015.9	NM	--	52.9	1017.0	28.6	995.5	16.8	981.2	8.5	995.0	14.7	1009.3
10/14/2018	89.6	1018.1	68.0	1016.7	56.9	1015.5	NM	--	53.3	1016.7	29.0	995.1	17.7	980.3	8.3	995.2	15.2	1008.8
11/23/2018	89.8	1017.9	68.3	1016.4	57.2	1015.3	NM	--	53.5	1016.4	29.2	994.9	17.8	980.2	8.3	995.2	15.3	1008.7
12/16/2018	89.9	1017.8	68.5	1016.2	57.3	1015.1	NM	--	53.6	1016.3	29.3	994.8	17.7	980.4	8.1	995.4	15.1	1008.9
1/5/2019	90.0	1017.6	68.7	1016.1	57.4	1015.0	NM	--	53.7	1016.2	29.4	994.7	17.4	980.7	8.0	995.5	14.6	1009.4
2/3/2019	90.2	1017.5	68.8	1015.9	57.5	1014.9	NM	--	53.8	1016.1	29.5	994.6	17.1	981.0	8.6	994.9	12.2	1011.8
3/2/2019	90.3	1017.3	68.8	1015.9	57.5	1015.0	NM	--	53.8	1016.2	29.3	994.8	16.0	982.1	7.6	995.9	11.1	1012.9
4/27/2019	90.4	1017.3	68.3	1016.4	56.9	1015.5	NM	--	53.5	1016.4	28.4	995.7	15.8	982.2	7.0	996.5	10.5	1013.5
5/25/2019	90.2	1017.5	68.1	1016.7	56.4	1016.0	NM	--	52.5	1017.5	27.6	996.5	8.6	989.5	7.3	996.2	9.9	1014.1
6/16/2019	90.0	1017.7	67.7	1017.0	56.1	1016.3	NM	--	52.2	1017.8	27.4	996.7	6.6	991.5	7.2	996.3	9.2	1014.8
7/26/2019	89.6	1018.0	67.2	1017.5	55.8	1016.6	NM	--	52.1	1017.9	27.6	996.5	13.0	985.1	8.0	995.5	11.8	1012.2
8/25/2019	89.4	1018.3	67.2	1017.6	55.9	1016.5	NM	--	52.3	1017.7	27.9	996.2	14.8	983.3	8.2	995.3	12.8	1011.2
9/24/2019	89.3	1018.4	67.3	1017.4	56.1	1016.3	NM	--	52.5	1017.5	28.2	995.9	15.8	982.3	8.0	995.5	12.5	1011.5
10/13/2019	89.2	1018.4	67.4	1017.3	56.2	1016.2	NM	--	52.5	1017.5	28.3	995.8	16.0	982.1	7.8	995.7	12.3	1011.7
11/24/2019	89.2	1018.4	67.5	1017.2	56.3	1016.2	NM	--	52.6	1017.4	28.3	995.8	15.6	982.4	7.5	996.0	11.9	1012.1
12/14/2019	89.2	1018.4	67.5	1017.2	56.2	1016.2	NM	--	52.5	1017.5	28.1	996.0	14.4	983.7	7.4	996.1	11.4	1012.6
1/5/2020	89.3	1018.4	67.6	1017.1	56.3	1016.2	NM	--	52.5	1017.4	28.1	996.0	12.7	985.4	7.3	996.2	11.4	1012.6
2/1/2020	89.2	1018.5	67.1	1017.6	55.6	1016.8	NM	--	51.8	1018.2	27.1	997.0	7.7	990.4	7.1	996.4	9.5	1014.5
3/7/2020	88.9	1018.7	66.6	1018.1	55.3	1017.2	NM	--	51.5	1018.4	27.0	997.1	8.0	990.1	7.2	996.3	11.1	1012.9
4/11/2020	89.0	1018.7	66.3	1018.5	55.0	1017.5	NM	--	51.2	1018.7	26.8	997.3	7.0	991.1	7.4	996.1	11.3	1012.7
5/25/2020	88.2	1019.4	66.1	1018.7	54.7	1017.7	NM	--	50.9	1019.1	26.5	997.6	5.8	992.3	7.2	996.3	8.9	1015.1
6/24/2020	87.9	1019.7	65.8	1018.9	54.5	1017.9	NM	--	50.8	1019.2	26.6	997.5	11.0	987.0	7.8	995.7	11.4	1012.6

Field Monitoring Well Water Elevation Data Over Time

Well #	#1		#2		#3		#4		#5		#6		#7		#8		#9	
Y	450672.2		448238.3		448206.4		449413.1		446166.0		450618.5		449801.5		449479.2		449464.5	
X	13342207.9		13342355.8		13340470.4		13338904.2		13341535.1		13338253.7		13336907.4		13338227.6		13338910.0	
Ground Elev. (ft)	1104.7		1081.8		1069.4		1016.8		1066.7		1021.2		993.4		997.2		1020.4	
T.O.C. Elev. (ft)	1107.7		1084.7		1072.4		1021.5		1069.9		1024.1		998.1		1003.5		1024.0	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
7/20/2020	87.8	1019.9	65.9	1018.9	54.7	1017.7	NM	--	51.1	1018.9	27.0	997.1	13.5	984.5	7.9	995.6	12.3	1011.7
8/30/2020	87.7	1020.0	66.2	1018.5	55.2	1017.3	NM	--	51.6	1018.3	27.5	996.6	16.0	982.1	7.2	996.3	12.6	1011.4
9/20/2020	87.8	1019.9	66.4	1018.3	55.4	1017.1	NM	--	51.8	1018.1	27.7	996.4	16.6	981.5	8.0	995.5	12.9	1011.1
10/24/2020	87.9	1019.7	66.7	1018.0	55.7	1016.8	NM	--	52.1	1017.8	28.0	996.1	17.3	980.8	7.8	995.7	13.6	1010.4
11/27/2020	88.1	1019.6	67.0	1017.7	56.0	1016.5	NM	--	52.4	1017.6	28.2	995.9	17.4	980.6	7.7	995.8	13.9	1010.1
12/19/2020	88.3	1019.4	67.3	1017.5	56.1	1016.3	NM	--	52.5	1017.4	28.4	995.7	17.4	980.7	7.7	995.8	13.6	1010.4
1/16/2021	88.5	1019.2	67.5	1017.2	56.4	1016.1	NM	--	52.7	1017.2	28.5	995.6	17.3	980.7	7.5	996.0	13.7	1010.3
2/28/2021	88.8	1018.9	67.9	1016.8	56.7	1015.8	NM	--	53.1	1016.9	28.8	995.3	17.0	981.0	6.4	997.1	12.2	1011.8
3/22/2021	89.0	1018.7	68.1	1016.7	56.8	1015.7	NM	--	53.2	1016.8	28.9	995.2	16.8	981.3	7.7	995.8	12.5	1011.5
4/18/2021	89.2	1018.4	68.2	1016.6	56.9	1015.6	NM	--	53.2	1016.8	28.8	995.3	14.2	983.9	7.8	995.7	12.7	1011.3
5/29/2021	89.6	1018.1	68.4	1016.3	57.1	1015.4	NM	--	53.4	1016.5	29.0	995.1	13.4	984.7	8.0	995.5	13.9	1010.2
6/27/2021	89.8	1017.9	68.6	1016.1	57.3	1015.1	NM	--	53.6	1016.3	29.1	995.0	12.9	985.1	7.0	996.5	13.7	1010.3
7/18/2021	89.9	1017.7	68.7	1016.1	57.4	1015.1	NM	--	53.6	1016.4	28.6	995.5	10.6	987.5	7.9	995.6	12.9	1011.1
8/7/2021	90.0	1017.6	68.7	1016.0	57.3	1015.1	NM	--	53.7	1016.3	28.7	995.4	11.5	986.5	8.1	995.4	12.0	1012.0
9/18/2021	90.2	1017.4	68.8	1016.0	57.4	1015.1	NM	--	53.8	1016.2	28.9	995.2	13.4	984.6	7.9	995.6	12.8	1011.2
10/23/2021	90.2	1017.4	68.4	1016.3	57.0	1015.5	NM	--	53.4	1016.5	28.5	995.6	12.0	986.0	7.4	996.1	10.8	1013.3
11/7/2021	92.1	1015.5	68.3	1016.4	56.8	1015.6	NM	--	53.2	1016.7	26.2	997.9	9.2	988.9	7.1	996.4	9.9	1014.1
12/24/2021	89.7	1018.0	67.8	1017.0	56.4	1016.1	NM	--	52.8	1017.1	27.9	996.2	8.5	989.6	7.2	996.3	11.8	1012.3
1/16/2022	89.5	1018.1	67.6	1017.1	56.3	1016.1	NM	--	52.7	1017.2	27.8	996.3	8.4	989.6	7.3	996.2	12.0	1012.0
2/27/2022	89.4	1018.3	67.5	1017.3	56.1	1016.4	NM	--	52.5	1017.5	27.6	996.5	6.9	991.1	7.0	996.5	10.7	1013.4
3/27/2022	89.3	1018.4	67.3	1017.5	55.9	1016.6	NM	--	52.2	1017.7	27.2	996.9	5.6	992.5	6.9	996.6	9.9	1014.2
4/24/2022	89.1	1018.6	67.0	1017.8	55.5	1016.9	NM	--	51.7	1018.2	26.9	997.2	6.7	991.4	7.2	996.3	10.9	1013.1
5/15/2022	88.9	1018.7	66.8	1018.0	55.3	1017.1	NM	--	51.5	1018.4	26.7	997.4	11.2	986.9	7.3	996.2	11.4	1012.6
6/19/2022	88.7	1018.9	66.5	1018.2	55.2	1017.3	NM	--	51.4	1018.6	26.9	997.2	10.1	988.0	7.6	995.9	11.7	1012.3
7/9/2022	88.5	1019.1	66.5	1018.2	55.3	1017.2	NM	--	51.6	1018.3	27.1	997.0	12.3	985.8	8.0	995.5	12.4	1011.6
8/20/2022	88.4	1019.3	66.8	1018.0	55.7	1016.8	NM	--	52.1	1017.9	27.6	996.5	15.0	983.1	8.0	995.5	13.1	1010.9
9/4/2022	88.4	1019.2	66.9	1017.8	55.8	1016.6	NM	--	52.3	1017.7	27.8	996.3	15.8	982.3	8.4	995.1	13.5	1010.5
10/9/2022	88.5	1019.1	67.2	1017.5	56.2	1016.3	NM	--	52.7	1017.3	28.2	995.9	16.9	981.1	8.2	995.3	14.1	1009.9
11/24/2022	88.8	1018.8	67.7	1017.1	56.6	1015.9	NM	--	53.1	1016.9	28.6	995.5	17.7	980.4	8.0	995.5	14.6	1009.4
12/17/2022	89.0	1018.6	67.9	1016.8	56.8	1015.6	NM	--	53.3	1016.6	28.7	995.4	17.8	980.2	8.0	995.5	14.8	1009.2
1/9/2022	89.2	1018.5	68.2	1016.6	57.0	1015.4	NM	--	53.5	1016.5	28.9	995.2	17.8	980.3	8.0	995.5	15.0	1009.0
2/6/2023	89.4	1018.3	68.4	1016.3	57.3	1015.1	NM	--	53.7	1016.2	29.1	995.0	17.8	980.3	7.9	995.6	15.2	1008.8
3/9/2023	89.7	1018.0	68.7	1016.0	57.5	1015.0	NM	--	53.9	1016.1	29.3	994.8	17.1	980.9	7.3	996.2	14.4	1009.6
4/11/2023	90.0	1017.7	68.8	1015.9	57.3	1015.1	NM	--	53.5	1016.4	28.5	995.6	10.6	987.5	7.1	996.4	9.2	1014.8
5/5/2023	90.1	1017.5	68.6	1016.2	57.0	1015.4	NM	--	53.2	1016.7	28.2	995.9	6.6	991.4	7.1	996.4	10.9	1013.2

Field Monitoring Well Water Elevation Data Over Time

Well #	#1		#2		#3		#4		#5		#6		#7		#8		#9	
Y	450672.2		448238.3		448206.4		449413.1		446166.0		450618.5		449801.5		449479.2		449464.5	
X	13342207.9		13342355.8		13340470.4		13338904.2		13341535.1		13338253.7		13336907.4		13338227.6		13338910.0	
Ground Elev. (ft)	1104.7		1081.8		1069.4		1016.8		1066.7		1021.2		993.4		997.2		1020.4	
T.O.C. Elev. (ft)	1107.7		1084.7		1072.4		1021.5		1069.9		1024.1		998.1		1003.5		1024.0	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
6/5/2023	90.1	1017.6	68.4	1016.4	56.9	1015.6	NM	--	53.1	1016.8	28.2	995.9	10.2	987.8	7.8	995.7	12.5	1011.5
7/14/2023	90.1	1017.5	68.4	1016.3	57.1	1015.4	NM	--	53.4	1016.5	28.6	995.5	12.7	985.3	7.4	996.1	13.3	1010.7
8/8/2023	90.2	1017.4	68.6	1016.2	57.2	1015.2	NM	--	53.6	1016.4	28.8	995.3	13.7	984.3	7.8	995.7	13.7	1010.4
9/11/2023	90.3	1017.4	68.1	1016.6	56.7	1015.8	NM	--	52.9	1017.1	28.4	995.7	7.0	991.0	7.5	996.0	10.4	1013.6
10/24/2023	90.0	1017.7	67.9	1016.8	56.6	1015.9	NM	--	52.9	1017.1	28.5	995.6	12.4	985.7	7.5	996.0	12.6	1011.4
11/25/2023	89.9	1017.8	68.0	1016.8	56.7	1015.8	NM	--	53.0	1016.9	28.6	995.5	12.5	985.5	7.3	996.2	12.8	1011.2
12/12/2023	89.9	1017.8	68.0	1016.7	56.7	1015.7	NM	--	53.0	1016.9	28.6	995.5	10.5	987.5	7.3	996.2	12.3	1011.7
1/8/2024	89.8	1017.8	68.0	1016.7	56.7	1015.7	NM	--	53.0	1016.9	28.5	995.6	8.9	989.2	7.2	996.3	11.9	1012.1
2/13/2024	89.8	1017.9	67.8	1017.0	56.2	1016.2	NM	--	52.4	1017.5	27.7	996.4	6.6	991.5	7.0	996.5	10.1	1013.9
3/14/2024	89.6	1018.0	67.4	1017.3	55.9	1016.5	NM	--	52.2	1017.8	27.5	996.6	8.5	989.6	7.1	996.4	11.5	1012.5
4/9/2024	89.3	1018.3	67.0	1017.7	55.7	1016.8	NM	--	52.0	1018.0	27.5	996.6	7.7	990.3	7.2	996.3	12.3	1011.7
5/15/2024	88.9	1018.8	66.7	1018.0	55.3	1017.1	NM	--	51.5	1018.5	27.0	997.1	7.0	991.1	7.3	996.2	11.7	1012.3
6/11/2024	88.8	1018.9	66.5	1018.2	55.2	1017.2	NM	--	51.4	1018.6	27.1	997.0	10.1	987.9	7.5	996.0	12.6	1011.5
7/20/2024	88.6	1019.1	66.6	1018.2	55.3	1017.1	NM	--	51.5	1018.4	27.3	996.8	10.3	987.7	7.5	996.0	12.1	1011.9
8/15/2024	88.5	1019.2	66.5	1018.3	55.2	1017.3	NM	--	51.3	1018.6	27.2	996.9	10.2	987.9	7.4	996.1	10.1	1013.9
9/19/2024	88.3	1019.4	66.4	1018.4	55.2	1017.3	NM	--	51.5	1018.4	27.4	996.7	12.7	985.4	7.8	995.7	11.9	1012.1
10/11/2024	88.1	1019.5	66.5	1018.3	55.3	1017.1	NM	--	51.7	1018.2	27.6	996.5	14.1	984.0	7.8	995.7	12.7	1011.3
11/18/2024	88.1	1019.6	66.7	1018.0	55.6	1016.8	NM	--	52.0	1017.9	27.9	996.2	14.9	983.2	7.5	996.0	13.3	1010.7
12/10/2024	88.2	1019.5	66.9	1017.9	55.8	1016.7	NM	--	52.2	1017.8	28.0	996.1	15.1	982.9	7.5	996.0	13.4	1010.6
1/17/2025	88.3	1019.3	67.1	1017.6	56.0	1016.5	NM	--	52.3	1017.6	28.2	995.9	14.9	983.2	7.2	996.3	12.5	1011.5
2/10/2025	88.6	1019.1	67.3	1017.4	56.2	1016.3	NM	--	52.6	1017.4	28.4	995.7	14.9	983.2	7.1	996.4	13.1	1010.9
3/12/2025	88.7	1019.0	67.5	1017.3	56.2	1016.2	NM	--	52.6	1017.4	28.3	995.8	12.9	985.1	7.0	996.5	11.2	1012.8
4/14/2025	88.7	1018.9	67.2	1017.5	55.7	1016.7	NM	--	52.0	1018.0	27.4	996.7	6.2	991.9	6.7	996.8	9.5	1014.5
5/15/2025	88.6	1019.1	66.7	1018.1	55.1	1017.4	NM	--	51.2	1018.7	26.6	997.5	6.0	992.0	6.9	996.6	9.5	1014.5
6/8/2025	88.4	1019.3	66.2	1018.5	54.8	1017.7	NM	--	51.0	1018.9	26.5	997.6	8.2	989.8	7.1	996.4	10.8	1013.2

NM = Not Measured
ABD = Abandoned

Field Monitoring Well Water Elevation Data Over Time

Well #	#10		#11		#12		#13		#14		#15		#16		#17		#18	
Y	449845.1		448785.6		448823.7		448468.5		448080.6		448079.3		447889.1		447126.5		448079.7	
X	13339583.4		13339146.0		13338724.7		13338673.3		13338791.7		13338787.8		13338943.7		13340226.6		13339904.8	
Ground Elev. (ft)	1020.3		1031.0		1018.3		1013.2		1014.0		1013.9		1012.5		1053.4		1031.7	
T.O.C. Elev. (ft)	1023.5		1033.8		1021.3		1016.3		1017.5		1017.3		1015.9		1056.9		1034.9	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
11/21/2008	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/14/2008	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/3/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/20/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/14/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/18/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/23/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/16/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/12/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/29/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/20/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/26/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/13/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/22/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/10/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/2/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/27/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/24/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/29/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/30/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/31/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/20/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/26/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/23/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/29/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/29/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/8/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/20/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/19/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/30/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/22/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/26/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/19/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/20/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/25/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--

Field Monitoring Well Water Elevation Data Over Time

Well #	#10		#11		#12		#13		#14		#15		#16		#17		#18	
Y	449845.1		448785.6		448823.7		448468.5		448080.6		448079.3		447889.1		447126.5		448079.7	
X	13339583.4		13339146.0		13338724.7		13338673.3		13338791.7		13338787.8		13338943.7		13340226.6		13339904.8	
Ground Elev. (ft)	1020.3		1031.0		1018.3		1013.2		1014.0		1013.9		1012.5		1053.4		1031.7	
T.O.C. Elev. (ft)	1023.5		1033.8		1021.3		1016.3		1017.5		1017.3		1015.9		1056.9		1034.9	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
10/28/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/26/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/26/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/11/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/5/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/17/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/25/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/30/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/16/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/28/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/19/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/28/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/28/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/27/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/26/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/19/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/17/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/17/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/28/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/25/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/30/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/21/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/31/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/28/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/29/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/14/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/30/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/31/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/15/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/23/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/13/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/31/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/27/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/31/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/29/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--

Field Monitoring Well Water Elevation Data Over Time

Well #	#10		#11		#12		#13		#14		#15		#16		#17		#18	
Y	449845.1		448785.6		448823.7		448468.5		448080.6		448079.3		447889.1		447126.5		448079.7	
X	13339583.4		13339146.0		13338724.7		13338673.3		13338791.7		13338787.8		13338943.7		13340226.6		13339904.8	
Ground Elev. (ft)	1020.3		1031.0		1018.3		1013.2		1014.0		1013.9		1012.5		1053.4		1031.7	
T.O.C. Elev. (ft)	1023.5		1033.8		1021.3		1016.3		1017.5		1017.3		1015.9		1056.9		1034.9	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
9/30/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/29/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/29/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/7/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/16/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/1/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/21/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/19/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/22/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/28/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/31/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/28/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/7/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/30/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/29/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/26/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/3/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/7/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/19/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/16/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/26/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/30/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/28/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/31/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/8/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/25/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/28/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/10/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/14/2017	10.5	1013.0	23.5	1010.3	10.5	1010.7	15.8	1000.4	7.5	1009.9	8.4	1008.9	6.6	1009.4	42.5	1014.4	17.4	1017.5
2/5/2017	10.3	1013.2	23.3	1010.5	10.9	1010.3	15.8	1000.4	7.3	1010.1	8.6	1008.7	6.6	1009.4	42.2	1014.7	16.8	1018.2
3/5/2017	10.1	1013.5	23.1	1010.7	10.5	1010.7	15.3	1000.9	7.1	1010.4	8.4	1008.9	6.3	1009.7	42.0	1015.0	16.3	1018.6
4/16/2017	9.4	1014.2	22.3	1011.5	10.5	1010.8	16.0	1000.3	6.5	1011.0	8.4	1008.9	5.5	1010.5	41.3	1015.6	15.0	1019.9
5/27/2017	9.0	1014.5	22.1	1011.7	11.0	1010.2	15.4	1000.8	6.1	1011.4	8.4	1008.9	5.3	1010.7	40.5	1016.5	15.3	1019.6
6/11/2017	9.0	1014.6	22.2	1011.6	11.5	1009.7	15.9	1000.4	6.1	1011.4	8.6	1008.6	5.5	1010.4	40.4	1016.6	15.6	1019.3
7/21/2017	9.0	1014.6	22.4	1011.4	12.1	1009.1	16.2	1000.1	6.3	1011.2	9.0	1008.3	6.1	1009.8	40.5	1016.4	16.5	1018.4

Field Monitoring Well Water Elevation Data Over Time

Well #	#10		#11		#12		#13		#14		#15		#16		#17		#18	
Y	449845.1		448785.6		448823.7		448468.5		448080.6		448079.3		447889.1		447126.5		448079.7	
X	13339583.4		13339146.0		13338724.7		13338673.3		13338791.7		13338787.8		13338943.7		13340226.6		13339904.8	
Ground Elev. (ft)	1020.3		1031.0		1018.3		1013.2		1014.0		1013.9		1012.5		1053.4		1031.7	
T.O.C. Elev. (ft)	1023.5		1033.8		1021.3		1016.3		1017.5		1017.3		1015.9		1056.9		1034.9	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
8/12/2017	9.1	1014.4	22.6	1011.2	12.2	1009.0	16.5	999.8	6.5	1011.0	8.9	1008.3	6.4	1009.6	40.7	1016.2	17.1	1017.9
9/3/2017	9.3	1014.3	22.7	1011.0	12.0	1009.2	15.8	1000.4	6.6	1010.9	8.8	1008.5	6.5	1009.5	40.9	1016.0	17.3	1017.6
10/22/2017	9.6	1013.9	23.0	1010.7	11.7	1009.5	15.4	1000.9	6.9	1010.6	8.8	1008.5	6.8	1009.2	41.4	1015.5	17.7	1017.2
11/24/2017	9.7	1013.8	23.0	1010.8	10.8	1010.4	15.3	1001.0	7.0	1010.5	8.6	1008.7	6.6	1009.3	41.6	1015.4	17.4	1017.5
12/3/2017	9.8	1013.7	23.1	1010.7	11.1	1010.1	15.6	1000.6	7.0	1010.4	8.7	1008.6	6.7	1009.2	41.6	1015.3	17.3	1017.6
1/14/2018	10.1	1013.5	23.3	1010.5	11.4	1009.9	15.6	1000.6	7.2	1010.3	8.3	1009.0	6.5	1009.4	41.9	1015.0	17.7	1017.2
2/3/2018	10.0	1013.5	23.2	1010.6	10.9	1010.3	15.6	1000.7	7.2	1010.3	8.7	1008.6	6.7	1009.3	41.9	1015.0	17.3	1017.6
3/3/2018	9.4	1014.2	22.5	1011.2	10.3	1010.9	15.0	1001.3	6.8	1010.7	8.3	1009.0	6.2	1009.8	41.5	1015.4	15.7	1019.3
4/22/2018	8.7	1014.8	21.8	1012.0	10.3	1011.0	15.1	1001.2	6.2	1011.3	8.4	1008.9	5.5	1010.4	40.8	1016.1	14.8	1020.1
5/13/2018	8.6	1015.0	21.7	1012.0	10.4	1010.9	14.9	1001.4	5.9	1011.6	7.9	1009.4	5.2	1010.7	40.3	1016.6	14.9	1020.0
6/2/2018	8.5	1015.0	22.0	1011.8	11.3	1010.0	15.5	1000.7	6.0	1011.5	8.5	1008.7	5.4	1010.6	40.0	1016.9	15.2	1019.7
7/7/2018	8.6	1014.9	22.3	1011.5	12.1	1009.1	16.2	1000.1	6.3	1011.2	9.0	1008.3	6.0	1010.0	40.2	1016.8	16.1	1018.8
8/26/2018	9.0	1014.6	22.7	1011.0	12.3	1008.9	16.3	999.9	6.7	1010.8	9.2	1008.0	6.5	1009.4	40.7	1016.3	17.2	1017.7
9/3/2018	9.0	1014.5	22.8	1010.9	12.4	1008.9	16.3	1000.0	6.7	1010.8	9.4	1007.9	6.7	1009.3	40.7	1016.2	17.4	1017.5
10/14/2018	9.3	1014.3	23.0	1010.7	11.6	1009.6	15.4	1000.9	6.9	1010.6	8.7	1008.5	6.7	1009.2	41.1	1015.8	17.3	1017.6
11/23/2018	9.5	1014.0	23.1	1010.7	11.1	1010.1	15.6	1000.7	7.0	1010.4	8.7	1008.6	6.7	1009.3	41.3	1015.6	17.3	1017.6
12/16/2018	9.6	1013.9	23.1	1010.6	10.9	1010.3	15.5	1000.7	7.1	1010.4	8.5	1008.7	6.7	1009.3	41.5	1015.5	17.3	1017.6
1/5/2019	9.7	1013.9	23.1	1010.7	10.6	1010.6	15.0	1001.3	7.1	1010.4	8.5	1008.8	6.5	1009.4	41.5	1015.4	17.2	1017.7
2/3/2019	9.8	1013.7	23.3	1010.5	11.1	1010.1	15.4	1000.9	7.2	1010.2	8.6	1008.7	6.7	1009.2	41.6	1015.3	17.5	1017.4
3/2/2019	9.6	1013.9	23.2	1010.6	11.1	1010.2	15.3	1001.0	7.1	1010.3	8.5	1008.8	6.6	1009.3	41.6	1015.4	16.6	1018.3
4/27/2019	8.9	1014.6	22.4	1011.4	10.2	1011.1	14.6	1001.7	6.5	1011.0	8.0	1009.3	5.6	1010.3	41.1	1015.8	15.3	1019.7
5/25/2019	8.7	1014.9	22.0	1011.8	10.9	1010.4	15.0	1001.3	6.1	1011.4	8.3	1009.0	5.3	1010.6	40.3	1016.6	15.0	1019.9
6/16/2019	8.3	1015.2	21.7	1012.1	10.4	1010.9	14.7	1001.6	6.0	1011.5	8.3	1009.0	5.0	1011.0	40.1	1016.9	14.8	1020.1
7/26/2019	8.3	1015.2	22.0	1011.8	11.9	1009.3	15.3	1001.0	6.0	1011.5	9.0	1008.3	5.7	1010.2	39.9	1017.1	15.7	1019.2
8/25/2019	8.5	1015.1	22.2	1011.5	12.2	1009.1	15.2	1001.1	6.2	1011.3	9.1	1008.2	6.1	1009.8	40.1	1016.9	16.3	1018.6
9/24/2019	8.6	1015.0	22.3	1011.4	11.7	1009.5	14.8	1001.5	6.3	1011.2	8.8	1008.5	6.2	1009.7	40.3	1016.7	16.6	1018.3
10/13/2019	8.6	1014.9	22.3	1011.5	11.1	1010.1	14.7	1001.5	6.3	1011.2	8.7	1008.6	6.2	1009.8	40.3	1016.6	16.4	1018.5
11/24/2019	8.6	1014.9	22.1	1011.6	10.5	1010.8	14.5	1001.8	6.3	1011.2	8.4	1008.9	6.0	1010.0	40.4	1016.6	16.2	1018.7
12/14/2019	8.5	1015.0	22.0	1011.8	10.7	1010.6	14.5	1001.8	6.2	1011.3	8.5	1008.8	6.0	1010.0	40.3	1016.6	15.9	1019.0
1/5/2020	8.5	1015.0	21.9	1011.8	10.5	1010.8	14.2	1002.0	6.2	1011.3	8.4	1008.9	8.9	1007.0	40.3	1016.6	15.8	1019.1
2/1/2020	7.9	1015.7	21.3	1012.5	10.4	1010.8	14.3	1002.0	5.6	1011.8	8.3	1008.9	5.4	1010.5	39.6	1017.3	14.8	1020.2
3/7/2020	7.7	1015.8	21.2	1012.5	10.7	1010.6	14.4	1001.8	5.5	1012.0	8.3	1009.0	5.3	1010.6	39.3	1017.6	15.1	1019.9
4/11/2020	7.6	1015.9	21.0	1012.8	10.8	1010.5	14.2	1002.0	5.3	1012.2	8.4	1008.9	5.2	1010.8	39.0	1017.9	14.8	1020.1
5/25/2020	7.3	1016.2	20.5	1013.3	10.4	1010.9	14.0	1002.3	5.0	1012.5	8.2	1009.1	4.8	1011.2	38.7	1018.2	14.5	1020.4
6/24/2020	7.3	1016.2	20.8	1013.0	11.6	1009.7	14.2	1002.1	5.2	1012.3	8.7	1008.5	5.2	1010.8	38.6	1018.3	15.1	1019.8

Field Monitoring Well Water Elevation Data Over Time

Well #	#10		#11		#12		#13		#14		#15		#16		#17		#18	
Y	449845.1		448785.6		448823.7		448468.5		448080.6		448079.3		447889.1		447126.5		448079.7	
X	13339583.4		13339146.0		13338724.7		13338673.3		13338791.7		13338787.8		13338943.7		13340226.6		13339904.8	
Ground Elev. (ft)	1020.3		1031.0		1018.3		1013.2		1014.0		1013.9		1012.5		1053.4		1031.7	
T.O.C. Elev. (ft)	1023.5		1033.8		1021.3		1016.3		1017.5		1017.3		1015.9		1056.9		1034.9	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
7/20/2020	7.5	1016.0	21.2	1012.6	11.9	1009.3	14.1	1002.2	5.4	1012.1	8.8	1008.5	5.6	1010.4	38.9	1018.0	15.7	1019.2
8/30/2020	7.8	1015.8	21.6	1012.1	11.8	1009.5	13.9	1002.3	5.7	1011.8	8.6	1008.7	5.9	1010.0	39.4	1017.5	15.3	1019.6
9/20/2020	7.9	1015.6	21.7	1012.1	11.8	1009.5	14.0	1002.3	5.8	1011.7	8.8	1008.5	6.1	1009.9	39.6	1017.3	16.3	1018.6
10/24/2020	8.1	1015.4	21.9	1011.8	11.3	1009.9	13.9	1002.4	6.0	1011.5	8.6	1008.7	6.2	1009.8	39.9	1017.1	16.6	1018.3
11/27/2020	8.4	1015.2	22.1	1011.7	11.0	1010.3	13.8	1002.5	6.1	1011.4	8.5	1008.8	6.3	1009.7	40.2	1016.8	16.8	1018.2
12/19/2020	8.5	1015.0	22.1	1011.6	10.9	1010.3	13.7	1002.5	6.2	1011.3	8.5	1008.8	6.3	1009.6	40.3	1016.6	16.8	1018.1
1/16/2021	8.7	1014.8	22.3	1011.4	10.9	1010.4	13.7	1002.5	6.3	1011.2	8.4	1008.9	6.4	1009.6	40.5	1016.4	16.9	1018.0
2/28/2021	9.0	1014.6	22.5	1011.2	10.7	1010.6	13.8	1002.5	6.5	1011.0	8.2	1009.1	6.6	1009.4	40.9	1016.1	17.3	1017.6
3/22/2021	9.0	1014.5	22.5	1011.3	11.1	1010.2	13.7	1002.6	6.6	1010.9	8.6	1008.6	6.5	1009.4	41.0	1016.0	16.9	1018.0
4/18/2021	9.1	1014.5	22.5	1011.3	10.9	1010.4	13.6	1002.7	6.5	1010.9	8.5	1008.8	6.3	1009.7	41.0	1016.0	16.4	1018.6
5/29/2021	9.4	1014.2	22.8	1010.9	11.4	1009.9	13.5	1002.7	6.8	1010.7	8.6	1008.7	6.7	1009.3	41.2	1015.7	16.9	1018.0
6/27/2021	9.4	1014.2	22.9	1010.8	9.8	1011.5	13.5	1002.8	6.9	1010.6	8.1	1009.2	6.4	1009.5	41.4	1015.5	17.1	1017.8
7/18/2021	9.5	1014.1	22.8	1011.0	11.3	1010.0	13.5	1002.7	6.8	1010.6	8.7	1008.5	6.4	1009.6	41.4	1015.6	15.3	1019.6
8/7/2021	9.5	1014.0	22.9	1010.9	11.7	1009.6	13.6	1002.6	6.9	1010.5	9.0	1008.3	6.5	1009.4	41.4	1015.5	16.5	1018.4
9/18/2021	9.5	1014.0	23.0	1010.8	11.7	1009.5	13.5	1002.8	7.0	1010.5	8.9	1008.4	6.7	1009.3	41.5	1015.4	16.9	1018.0
10/23/2021	9.0	1014.5	22.4	1011.4	10.9	1010.4	13.4	1002.9	6.7	1010.8	8.7	1008.6	6.4	1009.6	41.2	1015.8	16.0	1018.9
11/7/2021	8.7	1014.8	22.0	1011.7	10.6	1010.6	13.3	1003.0	6.5	1011.0	8.6	1008.7	6.1	1009.9	41.0	1016.0	15.6	1019.4
12/24/2021	8.6	1015.0	22.1	1011.7	10.8	1010.4	13.2	1003.1	6.2	1011.2	8.5	1008.8	6.0	1010.0	40.6	1016.3	15.8	1019.2
1/16/2022	8.5	1015.0	22.0	1011.8	10.9	1010.3	13.2	1003.1	6.2	1011.3	8.5	1008.7	5.9	1010.0	40.5	1016.5	15.9	1019.0
2/27/2022	8.2	1015.3	21.9	1011.9	10.9	1010.3	13.1	1003.1	6.0	1011.5	8.4	1008.9	5.8	1010.1	40.3	1016.7	15.2	1019.7
3/27/2022	7.9	1015.6	21.2	1012.6	10.0	1011.3	12.7	1003.5	5.7	1011.8	8.2	1009.1	5.4	1010.6	40.0	1017.0	14.8	1020.2
4/24/2022	7.8	1015.7	21.2	1012.6	10.3	1010.9	12.9	1003.4	5.5	1012.0	8.2	1009.1	5.2	1010.8	39.6	1017.4	14.8	1020.1
5/15/2022	7.8	1015.8	21.0	1012.7	10.8	1010.4	12.8	1003.4	5.4	1012.1	9.2	1008.1	11.2	1004.7	39.3	1017.6	14.8	1020.2
6/19/2022	7.7	1015.8	21.2	1012.6	11.6	1009.7	13.0	1003.2	5.4	1012.1	8.7	1008.6	5.2	1010.8	39.2	1017.7	15.2	1019.7
7/9/2022	7.8	1015.7	21.5	1012.3	12.1	1009.1	13.2	1003.0	5.6	1011.9	9.0	1008.3	5.6	1010.4	39.4	1017.5	15.7	1019.2
8/20/2022	8.1	1015.4	21.9	1011.9	12.2	1009.1	13.3	1002.9	6.0	1011.5	8.9	1008.4	6.1	1009.9	39.9	1017.1	16.4	1018.5
9/4/2022	8.2	1015.3	22.1	1011.7	12.5	1008.8	13.6	1002.7	6.1	1011.4	9.3	1008.0	6.3	1009.6	40.0	1016.9	16.7	1018.2
10/9/2022	8.5	1015.0	22.3	1011.5	12.0	1009.2	13.6	1002.7	6.3	1011.2	9.0	1008.3	6.5	1009.4	40.4	1016.5	17.1	1017.8
11/24/2022	8.9	1014.6	22.6	1011.2	11.8	1009.4	13.2	1003.1	6.6	1010.9	8.8	1008.5	6.6	1009.3	40.8	1016.1	17.4	1017.5
12/17/2022	9.1	1014.4	22.8	1011.0	11.7	1009.6	13.1	1003.1	6.7	1010.8	8.7	1008.6	6.7	1009.2	41.0	1015.9	17.6	1017.3
1/9/2022	9.3	1014.2	22.9	1010.9	11.5	1009.8	12.9	1003.3	6.8	1010.7	8.6	1008.7	6.7	1009.2	41.2	1015.7	17.6	1017.3
2/6/2023	9.6	1013.9	23.1	1010.7	11.4	1009.9	13.1	1003.2	6.9	1010.6	8.7	1008.6	6.8	1009.1	41.5	1015.4	17.7	1017.2
3/9/2023	9.7	1013.9	23.0	1010.8	10.2	1011.1	12.9	1003.4	7.0	1010.5	8.2	1009.1	6.6	1009.3	41.6	1015.3	17.3	1017.6
4/11/2023	9.1	1014.4	22.0	1011.7	10.0	1011.3	12.7	1003.6	6.6	1010.9	8.3	1009.0	6.1	1009.9	41.4	1015.6	15.3	1019.6
5/5/2023	9.1	1014.5	22.3	1011.4	10.4	1010.9	12.6	1003.6	6.5	1011.0	8.2	1009.0	6.0	1009.9	41.0	1015.9	15.3	1019.6

Field Monitoring Well Water Elevation Data Over Time

Well #	#10		#11		#12		#13		#14		#15		#16		#17		#18	
Y	449845.1		448785.6		448823.7		448468.5		448080.6		448079.3		447889.1		447126.5		448079.7	
X	13339583.4		13339146.0		13338724.7		13338673.3		13338791.7		13338787.8		13338943.7		13340226.6		13339904.8	
Ground Elev. (ft)	1020.3		1031.0		1018.3		1013.2		1014.0		1013.9		1012.5		1053.4		1031.7	
T.O.C. Elev. (ft)	1023.5		1033.8		1021.3		1016.3		1017.5		1017.3		1015.9		1056.9		1034.9	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
6/5/2023	9.2	1014.4	22.5	1011.2	11.7	1009.6	12.7	1003.5	6.5	1010.9	8.8	1008.5	6.5	1009.5	40.9	1016.0	15.9	1019.0
7/14/2023	9.3	1014.2	22.8	1011.0	11.7	1009.6	12.8	1003.5	6.7	1010.7	8.6	1008.6	6.6	1009.3	41.2	1015.7	16.6	1018.3
8/8/2023	9.5	1014.0	23.0	1010.8	11.8	1009.5	13.0	1003.3	6.9	1010.6	8.7	1008.5	6.7	1009.2	41.3	1015.6	17.0	1017.9
9/11/2023	8.8	1014.8	22.2	1011.6	10.9	1010.4	12.7	1003.5	6.4	1011.1	8.6	1008.7	6.3	1009.6	40.7	1016.2	15.3	1019.7
10/24/2023	8.8	1014.7	22.3	1011.5	11.0	1010.3	13.1	1003.2	6.4	1011.1	8.7	1008.6	6.4	1009.5	40.7	1016.3	15.6	1019.3
11/25/2023	8.9	1014.6	22.4	1011.4	10.9	1010.3	13.0	1003.3	6.4	1011.0	8.6	1008.7	6.4	1009.6	40.8	1016.2	16.0	1018.9
12/12/2023	9.0	1014.6	22.4	1011.4	10.8	1010.5	12.9	1003.3	6.4	1011.0	8.6	1008.7	6.3	1009.7	40.8	1016.1	16.1	1018.8
1/8/2024	8.9	1014.6	22.3	1011.5	10.8	1010.5	12.8	1003.4	6.4	1011.1	8.5	1008.8	6.2	1009.8	40.8	1016.1	16.0	1018.9
2/13/2024	8.3	1015.3	21.5	1012.2	10.7	1010.6	12.7	1003.6	5.9	1011.6	8.5	1008.8	5.5	1010.4	40.2	1016.7	14.9	1020.1
3/14/2024	8.2	1015.3	21.6	1012.1	11.0	1010.3	12.7	1003.6	5.8	1011.7	8.5	1008.8	5.5	1010.4	40.0	1017.0	15.1	1019.8
4/9/2024	8.1	1015.4	21.5	1012.2	10.8	1010.4	12.6	1003.7	5.7	1011.8	8.4	1008.9	5.4	1010.5	39.8	1017.2	15.3	1019.6
5/15/2024	7.8	1015.7	21.0	1012.7	10.8	1010.4	12.5	1003.7	5.3	1012.2	8.4	1008.9	4.9	1011.1	39.3	1017.6	14.8	1020.1
6/11/2024	7.8	1015.7	21.3	1012.5	11.3	1010.0	12.6	1003.7	5.4	1012.1	8.5	1008.8	5.2	1010.8	39.2	1017.7	15.3	1019.6
7/20/2024	7.8	1015.7	21.2	1012.6	10.8	1010.4	12.6	1003.7	5.5	1012.0	8.5	1008.8	5.4	1010.5	39.4	1017.6	15.4	1019.5
8/15/2024	7.6	1015.9	21.0	1012.7	11.1	1010.2	12.8	1003.5	5.4	1012.0	8.6	1008.7	5.6	1010.4	39.2	1017.7	15.4	1019.6
9/19/2024	7.6	1015.9	21.4	1012.3	11.9	1009.4	13.1	1003.1	5.6	1011.9	8.9	1008.3	5.9	1010.0	39.4	1017.6	15.9	1019.0
10/11/2024	7.8	1015.7	21.6	1012.1	11.8	1009.4	13.2	1003.0	5.7	1011.7	9.0	1008.3	6.2	1009.8	39.5	1017.4	16.3	1018.7
11/18/2024	8.0	1015.5	21.8	1012.0	11.4	1009.9	13.0	1003.3	5.9	1011.6	8.6	1008.7	6.2	1009.8	39.8	1017.1	16.4	1018.5
12/10/2024	8.2	1015.4	21.9	1011.9	11.2	1010.0	13.2	1003.1	5.9	1011.5	8.5	1008.8	6.2	1009.7	39.9	1017.0	16.6	1018.4
1/17/2025	8.3	1015.2	21.9	1011.9	11.0	1010.2	13.2	1003.1	6.0	1011.4	8.6	1008.7	6.3	1009.6	40.2	1016.8	16.7	1018.2
2/10/2025	8.5	1015.1	22.1	1011.6	11.1	1010.2	13.2	1003.1	6.2	1011.3	8.6	1008.7	6.4	1009.6	40.3	1016.6	16.8	1018.1
3/12/2025	8.4	1015.2	21.8	1011.9	10.4	1010.8	13.0	1003.3	6.1	1011.4	8.5	1008.8	6.2	1009.7	40.4	1016.6	16.3	1018.6
4/14/2025	7.8	1015.7	21.1	1012.7	10.4	1010.9	12.5	1003.7	5.6	1011.8	8.3	1009.0	5.7	1010.2	39.8	1017.2	14.7	1020.2
5/15/2025	7.4	1016.2	20.5	1013.2	10.4	1010.8	12.4	1003.8	5.1	1012.4	8.2	1009.1	5.0	1010.9	39.0	1017.9	14.3	1020.7
6/8/2025	7.3	1016.3	20.7	1013.0	10.9	1010.4	12.4	1003.9	5.1	1012.4	8.3	1009.0	5.1	1010.8	38.8	1018.1	14.7	1020.2

NM = Not Measured

ABD = Abandoned

Field Monitoring Well Water Elevation Data Over Time

Well #	#19		#20		#21		#22		#23		#24		#25	
Y	446533.0		448446.9		450154.0		450722.3		446263.4		447268.4		448154.9	
X	13340269.9		13340018.5		13342179.3		13339810.9		13342414.6		13341287.3		13342376.6	
Ground Elev. (ft)	1054.1		1045.1		1103.9		1056.8		1064.4		1069.4		1083.5	
T.O.C. Elev. (ft)	1057.3		1047.8		1106.9		1059.8		1067.2		1072.5		1086.8	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
11/21/2008	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/14/2008	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/3/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/20/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/14/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/18/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/23/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/16/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/12/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/29/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/20/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/26/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/13/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/22/2009	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/10/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/2/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/27/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/24/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/29/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/30/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/31/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/20/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/26/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/23/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/29/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/29/2010	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/8/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/20/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/19/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/30/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/22/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/26/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/19/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/20/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/25/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--

Field Monitoring Well Water Elevation Data Over Time

Well #	#19		#20		#21		#22		#23		#24		#25	
Y	446533.0		448446.9		450154.0		450722.3		446263.4		447268.4		448154.9	
X	13340269.9		13340018.5		13342179.3		13339810.9		13342414.6		13341287.3		13342376.6	
Ground Elev. (ft)	1054.1		1045.1		1103.9		1056.8		1064.4		1069.4		1083.5	
T.O.C. Elev. (ft)	1057.3		1047.8		1106.9		1059.8		1067.2		1072.5		1086.8	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
10/28/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/26/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/26/2011	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/11/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/5/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/17/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/25/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/30/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/16/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/28/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/19/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/28/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/28/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/27/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/26/2012	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/19/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/17/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/17/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/28/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/25/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/30/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/21/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/31/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/28/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/29/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/14/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/30/2013	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/31/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/15/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/23/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/13/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/31/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/27/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/31/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/29/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--

Field Monitoring Well Water Elevation Data Over Time

Well #	#19		#20		#21		#22		#23		#24		#25	
Y	446533.0		448446.9		450154.0		450722.3		446263.4		447268.4		448154.9	
X	13340269.9		13340018.5		13342179.3		13339810.9		13342414.6		13341287.3		13342376.6	
Ground Elev. (ft)	1054.1		1045.1		1103.9		1056.8		1064.4		1069.4		1083.5	
T.O.C. Elev. (ft)	1057.3		1047.8		1106.9		1059.8		1067.2		1072.5		1086.8	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
9/30/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/29/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/29/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/7/2014	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/16/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/1/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/21/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/19/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/22/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/28/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/31/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/28/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/7/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/30/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/29/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/26/2015	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/3/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
2/7/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
3/19/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
4/16/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
5/26/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
6/30/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
7/28/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
8/31/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
9/8/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
10/25/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
11/28/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
12/10/2016	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--	NM	--
1/14/2017	42.6	1014.7	34.3	1013.5	91.5	1015.4	52.5	1007.4	51.4	1015.8	57.7	1014.8	71.9	1015.0
2/5/2017	42.3	1015.0	34.0	1013.8	91.4	1015.5	52.1	1007.7	51.0	1016.2	57.4	1015.1	71.6	1015.2
3/5/2017	42.0	1015.2	33.8	1014.0	91.2	1015.7	51.9	1007.9	50.9	1016.3	57.2	1015.3	71.4	1015.4
4/16/2017	41.3	1016.0	33.3	1014.5	91.0	1015.8	51.4	1008.4	50.4	1016.8	56.6	1015.9	71.1	1015.7
5/27/2017	40.5	1016.8	32.5	1015.3	90.6	1016.3	50.7	1009.2	49.7	1017.5	55.7	1016.8	70.2	1016.6
6/11/2017	40.4	1016.9	32.4	1015.4	90.4	1016.5	50.5	1009.3	49.5	1017.7	55.6	1016.9	69.9	1016.9
7/21/2017	40.6	1016.7	32.3	1015.5	89.8	1017.0	50.5	1009.4	49.6	1017.6	55.7	1016.8	69.6	1017.2

Field Monitoring Well Water Elevation Data Over Time

Well #	#19		#20		#21		#22		#23		#24		#25	
Y	446533.0		448446.9		450154.0		450722.3		446263.4		447268.4		448154.9	
X	13340269.9		13340018.5		13342179.3		13339810.9		13342414.6		13341287.3		13342376.6	
Ground Elev. (ft)	1054.1		1045.1		1103.9		1056.8		1064.4		1069.4		1083.5	
T.O.C. Elev. (ft)	1057.3		1047.8		1106.9		1059.8		1067.2		1072.5		1086.8	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
8/12/2017	40.8	1016.5	32.5	1015.3	89.7	1017.2	50.6	1009.2	49.7	1017.5	55.9	1016.6	69.8	1017.1
9/3/2017	41.0	1016.2	32.7	1015.1	89.6	1017.2	50.8	1009.1	50.0	1017.2	56.1	1016.4	70.0	1016.9
10/22/2017	41.5	1015.8	33.1	1014.8	89.7	1017.2	51.1	1008.7	50.4	1016.8	56.5	1016.0	70.4	1016.5
11/24/2017	41.7	1015.6	33.2	1014.6	89.9	1017.0	51.4	1008.5	50.6	1016.6	56.8	1015.7	70.6	1016.2
12/3/2017	41.7	1015.5	33.3	1014.5	90.0	1016.9	51.4	1008.4	50.7	1016.5	56.8	1015.7	70.7	1016.1
1/14/2018	42.0	1015.3	33.6	1014.2	90.2	1016.7	51.7	1008.2	51.0	1016.2	57.1	1015.4	71.0	1015.8
2/3/2018	42.0	1015.3	33.6	1014.2	90.3	1016.6	51.7	1008.1	51.2	1016.0	57.1	1015.4	71.1	1015.7
3/3/2018	41.6	1015.7	33.3	1014.5	90.5	1016.4	51.4	1008.4	50.6	1016.6	56.7	1015.8	71.0	1015.8
4/22/2018	40.9	1016.4	32.7	1015.1	90.2	1016.7	50.8	1009.1	50.0	1017.2	56.0	1016.5	70.4	1016.4
5/13/2018	40.4	1016.9	32.3	1015.5	90.0	1016.9	50.3	1009.5	49.5	1017.7	55.6	1016.9	70.1	1016.7
6/2/2018	40.1	1017.2	32.1	1015.8	89.8	1017.1	50.1	1009.7	49.2	1018.0	55.3	1017.2	69.7	1017.1
7/7/2018	40.2	1017.0	32.0	1015.8	89.5	1017.4	50.0	1009.8	49.2	1018.0	55.3	1017.2	69.4	1017.4
8/26/2018	40.8	1016.5	32.4	1015.4	89.3	1017.6	50.4	1009.5	49.7	1017.5	55.8	1016.7	69.7	1017.2
9/3/2018	40.8	1016.4	32.5	1015.3	89.3	1017.6	50.4	1009.4	49.8	1017.4	55.9	1016.6	69.7	1017.1
10/14/2018	41.2	1016.1	32.8	1015.1	89.4	1017.5	50.8	1009.1	50.1	1017.1	56.2	1016.3	70.1	1016.8
11/23/2018	41.4	1015.9	33.0	1014.8	89.6	1017.3	51.1	1008.8	50.4	1016.8	56.5	1016.0	70.4	1016.4
12/16/2018	41.5	1015.7	33.2	1014.7	89.7	1017.2	51.2	1008.6	50.5	1016.7	56.6	1015.9	70.6	1016.3
1/5/2019	41.6	1015.7	33.3	1014.6	89.9	1017.0	51.3	1008.5	50.6	1016.6	56.7	1015.8	70.7	1016.1
2/3/2019	41.8	1015.5	33.4	1014.4	90.0	1016.9	51.5	1008.4	50.7	1016.5	56.8	1015.7	70.8	1016.0
3/2/2019	41.7	1015.6	33.3	1014.5	90.2	1016.7	51.5	1008.4	50.6	1016.6	56.8	1015.7	70.9	1016.0
4/27/2019	41.4	1015.8	32.8	1015.1	90.1	1016.8	50.9	1008.9	50.0	1017.2	56.6	1015.9	70.4	1016.5
5/25/2019	40.4	1016.9	32.4	1015.5	90.0	1016.9	50.4	1009.4	49.5	1017.7	55.6	1016.9	70.1	1016.7
6/16/2019	40.1	1017.2	32.1	1015.7	89.7	1017.1	50.2	1009.7	49.1	1018.1	55.3	1017.2	69.7	1017.1
7/26/2019	40.0	1017.3	31.8	1016.1	89.3	1017.6	49.8	1010.0	49.0	1018.2	55.1	1017.4	69.2	1017.6
8/25/2019	40.2	1017.1	31.9	1015.9	89.1	1017.8	49.9	1009.9	49.1	1018.1	55.2	1017.3	69.2	1017.6
9/24/2019	40.4	1016.9	32.1	1015.8	89.0	1017.9	50.1	1009.7	49.3	1017.9	55.4	1017.1	69.4	1017.5
10/13/2019	40.4	1016.9	32.1	1015.7	88.9	1018.0	50.2	1009.6	49.3	1017.9	55.5	1017.0	69.4	1017.4
11/24/2019	40.5	1016.8	32.2	1015.6	89.0	1017.9	50.3	1009.5	49.4	1017.8	55.5	1017.0	69.5	1017.3
12/14/2019	40.4	1016.9	32.1	1015.7	89.1	1017.8	50.2	1009.6	49.4	1017.8	55.5	1017.0	69.5	1017.3
1/5/2020	40.4	1016.9	32.2	1015.7	89.1	1017.8	50.3	1009.5	49.4	1017.8	55.5	1017.0	69.6	1017.2
2/1/2020	39.7	1017.6	31.6	1016.3	88.9	1017.9	49.5	1010.3	48.8	1018.4	54.8	1017.7	69.2	1017.6
3/7/2020	39.4	1017.9	31.2	1016.6	88.6	1018.3	49.2	1010.6	48.5	1018.7	54.5	1018.0	68.6	1018.2
4/11/2020	39.1	1018.2	31.0	1016.8	88.3	1018.6	49.0	1010.8	48.2	1019.0	54.2	1018.3	68.3	1018.5
5/25/2020	38.8	1018.5	30.7	1017.1	87.9	1018.9	48.9	1011.0	47.7	1019.5	53.9	1018.6	68.1	1018.7
6/24/2020	38.7	1018.6	30.5	1017.3	87.7	1019.2	48.6	1011.2	47.6	1019.6	53.7	1018.8	67.8	1019.0

Field Monitoring Well Water Elevation Data Over Time

Well #	#19		#20		#21		#22		#23		#24		#25	
Y	446533.0		448446.9		450154.0		450722.3		446263.4		447268.4		448154.9	
X	13340269.9		13340018.5		13342179.3		13339810.9		13342414.6		13341287.3		13342376.6	
Ground Elev. (ft)	1054.1		1045.1		1103.9		1056.8		1064.4		1069.4		1083.5	
T.O.C. Elev. (ft)	1057.3		1047.8		1106.9		1059.8		1067.2		1072.5		1086.8	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
7/20/2020	39.0	1018.3	30.8	1017.1	87.5	1019.4	48.8	1011.1	47.9	1019.3	54.0	1018.5	67.9	1018.9
8/30/2020	39.6	1017.7	31.1	1016.7	87.6	1019.3	49.2	1010.7	48.3	1018.9	54.5	1018.0	68.2	1018.6
9/20/2020	39.7	1017.6	31.3	1016.5	87.7	1019.2	49.4	1010.5	48.5	1018.7	54.7	1017.8	68.4	1018.4
10/24/2020	40.0	1017.3	31.6	1016.2	87.9	1019.0	49.6	1010.2	48.8	1018.4	55.0	1017.5	68.7	1018.1
11/27/2020	40.3	1017.0	31.8	1016.0	88.1	1018.8	50.0	1009.9	49.1	1018.1	55.3	1017.2	69.1	1017.8
12/19/2020	40.4	1016.9	32.0	1015.8	88.2	1018.7	50.1	1009.7	49.3	1017.9	55.5	1017.0	69.3	1017.5
1/16/2021	40.6	1016.6	32.2	1015.6	88.4	1018.4	50.3	1009.5	49.5	1017.7	55.7	1016.8	69.5	1017.3
2/28/2021	41.0	1016.3	32.6	1015.3	88.8	1018.1	50.7	1009.2	49.9	1017.3	56.0	1016.5	69.9	1016.9
3/22/2021	41.1	1016.2	32.6	1015.2	89.0	1017.9	50.8	1009.1	50.0	1017.2	56.1	1016.4	70.1	1016.7
4/18/2021	41.1	1016.2	32.7	1015.1	89.2	1017.7	50.9	1009.0	50.1	1017.1	56.2	1016.3	70.2	1016.6
5/29/2021	41.3	1016.0	32.9	1014.9	89.5	1017.3	51.0	1008.8	50.3	1016.9	56.4	1016.1	70.5	1016.4
6/27/2021	41.5	1015.8	33.1	1014.7	89.7	1017.2	51.2	1008.7	50.5	1016.7	56.6	1015.9	70.6	1016.2
7/18/2021	41.5	1015.8	33.1	1014.7	89.9	1017.0	51.1	1008.8	50.4	1016.8	56.6	1015.9	70.7	1016.1
8/7/2021	41.5	1015.8	33.2	1014.6	90.0	1016.9	51.1	1008.7	50.5	1016.7	56.6	1015.9	70.8	1016.1
9/18/2021	41.7	1015.6	33.2	1014.6	90.1	1018.2	51.1	1008.7	50.6	1016.6	56.7	1015.8	70.8	1016.0
10/23/2021	41.3	1016.0	32.8	1015.0	90.0	1016.9	50.8	1009.1	50.3	1016.9	56.3	1016.2	70.5	1016.3
11/7/2021	41.1	1016.2	32.7	1015.2	89.9	1017.0	50.6	1009.3	50.1	1017.1	56.1	1016.4	70.3	1016.5
12/24/2021	40.7	1016.6	32.3	1015.5	89.5	1019.2	50.2	1009.7	49.8	1017.4	55.8	1016.7	69.8	1017.0
1/16/2022	40.6	1016.7	32.2	1015.6	89.2	1017.7	50.1	1009.7	49.6	1017.6	55.7	1016.8	69.7	1017.1
2/27/2022	40.4	1016.9	32.0	1015.8	89.1	1017.8	50.0	1009.8	49.4	1017.8	55.4	1017.1	69.5	1017.3
3/27/2022	40.1	1017.2	31.8	1016.0	89.1	1017.8	49.8	1010.0	49.1	1018.1	55.2	1017.3	69.3	1017.5
4/24/2022	39.6	1017.7	31.5	1016.3	88.9	1018.2	49.4	1010.4	48.7	1018.5	54.8	1017.7	69.0	1017.8
5/15/2022	39.4	1017.9	31.3	1016.5	88.7	1018.2	49.3	1010.6	48.5	1018.7	54.6	1017.9	68.8	1018.0
6/19/2022	39.3	1018.0	31.2	1016.7	88.5	1018.4	49.1	1010.7	48.3	1018.9	54.4	1018.1	68.5	1018.3
7/9/2022	39.5	1017.8	31.2	1016.6	88.3	1019.2	49.2	1010.7	48.4	1018.8	54.5	1018.0	68.5	1018.3
8/20/2022	40.0	1017.3	31.6	1016.2	88.2	1018.7	49.5	1010.3	48.9	1018.3	55.0	1017.5	68.8	1018.0
9/4/2022	40.2	1017.1	31.7	1016.1	88.3	1018.6	49.7	1010.2	49.0	1018.2	55.2	1017.3	69.0	1017.9
10/9/2022	40.5	1016.8	32.0	1015.8	88.4	1020.2	50.0	1009.9	46.4	1020.8	55.5	1017.0	69.3	1017.5
11/24/2022	41.0	1016.3	32.4	1015.4	88.7	1018.2	50.4	1009.4	49.8	1017.4	56.0	1016.5	69.7	1017.1
12/17/2022	41.2	1016.1	32.6	1015.2	88.9	1018.0	50.6	1009.2	50.5	1016.7	56.2	1016.3	70.0	1016.8
1/9/2022	41.4	1015.9	32.8	1015.0	89.1	1017.8	50.8	1009.0	50.3	1016.9	56.4	1016.1	70.2	1016.6
2/6/2023	41.6	1015.7	33.1	1014.7	89.4	1019.2	51.0	1008.8	50.5	1016.7	56.6	1015.9	70.5	1016.3
3/9/2023	41.7	1015.5	33.3	1014.5	89.6	1017.3	51.3	1008.5	50.7	1016.5	56.8	1015.7	70.8	1016.1
4/11/2023	41.4	1015.9	33.1	1014.7	89.9	1016.9	51.2	1008.6	50.4	1016.8	56.6	1015.9	70.8	1016.0
5/5/2023	41.1	1016.2	32.9	1014.9	90.1	1020.2	50.9	1009.0	50.2	1017.0	56.3	1016.2	70.6	1016.2

Field Monitoring Well Water Elevation Data Over Time

Well #	#19		#20		#21		#22		#23		#24		#25	
Y	446533.0		448446.9		450154.0		450722.3		446263.4		447268.4		448154.9	
X	13340269.9		13340018.5		13342179.3		13339810.9		13342414.6		13341287.3		13342376.6	
Ground Elev. (ft)	1054.1		1045.1		1103.9		1056.8		1064.4		1069.4		1083.5	
T.O.C. Elev. (ft)	1057.3		1047.8		1106.9		1059.8		1067.2		1072.5		1086.8	
	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)	Depth (ft)	Elev. (ft)
6/5/2023	41.0	1016.3	32.8	1015.1	89.9	1016.9	50.7	1009.1	50.0	1017.2	56.1	1016.4	70.4	1016.4
7/14/2023	41.3	1016.0	32.9	1014.9	90.0	1016.9	50.9	1008.9	50.2	1017.0	56.4	1016.1	70.4	1016.4
8/8/2023	41.4	1015.8	33.1	1014.7	90.0	1016.9	51.0	1008.8	50.4	1016.8	56.5	1016.0	70.6	1016.2
9/11/2023	40.8	1016.5	32.5	1015.3	90.0	1016.9	50.6	1009.3	49.5	1017.7	55.8	1016.7	70.1	1016.7
10/24/2023	40.8	1016.5	32.4	1015.4	89.7	1017.2	50.5	1009.3	49.7	1017.5	55.8	1016.7	69.9	1016.9
11/25/2023	40.9	1016.4	32.5	1015.3	89.7	1017.2	50.6	1009.2	49.9	1017.3	56.0	1016.5	70.0	1016.8
12/12/2023	40.9	1016.4	32.6	1015.2	89.6	1017.3	50.7	1009.1	49.9	1017.3	56.0	1016.5	70.0	1016.8
1/8/2024	40.9	1016.4	32.6	1015.2	89.6	1017.3	50.7	1009.2	50.9	1016.3	56.0	1016.5	70.0	1016.8
2/13/2024	40.3	1017.0	32.1	1015.7	89.6	1017.3	50.2	1009.7	49.4	1017.8	55.4	1017.1	69.8	1017.1
3/14/2024	40.1	1017.2	31.9	1016.0	89.3	1017.5	49.9	1010.0	49.1	1018.1	55.2	1017.3	69.4	1017.4
4/9/2024	39.8	1017.4	31.6	1016.2	89.0	1017.9	49.7	1010.1	48.9	1018.3	55.0	1017.5	69.0	1017.8
5/15/2024	39.3	1018.0	31.3	1016.5	88.7	1018.2	49.4	1010.4	48.4	1018.8	54.5	1018.0	68.7	1018.1
6/11/2024	39.3	1018.0	31.2	1016.6	88.5	1018.4	49.3	1010.5	48.3	1018.9	54.4	1018.1	68.5	1018.3
7/20/2024	39.4	1017.8	31.3	1016.5	88.3	1018.6	49.5	1010.4	48.3	1018.9	54.5	1018.0	68.6	1018.2
8/15/2024	39.3	1018.0	31.2	1016.7	88.2	1018.7	49.2	1010.6	48.1	1019.1	54.4	1018.1	68.5	1018.3
9/19/2024	39.4	1017.8	31.2	1016.6	88.1	1018.8	49.1	1010.7	48.3	1018.9	54.5	1018.0	68.4	1018.4
10/11/2024	39.6	1017.7	31.3	1016.5	87.9	1019.0	49.3	1010.5	48.5	1018.7	54.6	1017.9	68.5	1018.3
11/18/2024	39.9	1017.4	31.6	1016.3	88.0	1018.9	49.6	1010.2	48.8	1018.4	54.9	1017.6	68.7	1018.1
12/10/2024	40.0	1017.2	31.7	1016.1	88.1	1018.8	49.8	1010.0	48.9	1018.3	55.1	1017.4	68.9	1017.9
1/17/2025	40.3	1017.0	31.9	1015.9	88.2	1018.7	50.0	1009.8	49.1	1018.1	55.3	1017.2	69.1	1017.7
2/10/2025	40.4	1016.8	32.1	1015.8	88.5	1018.4	50.2	1009.6	49.3	1017.9	55.5	1017.0	69.3	1017.5
3/12/2025	40.5	1016.8	32.1	1015.7	88.6	1018.3	50.3	1009.6	49.4	1017.8	55.5	1017.0	69.5	1017.3
4/14/2025	39.9	1017.4	31.6	1016.2	88.6	1018.3	49.7	1010.1	48.9	1018.3	55.0	1017.5	69.3	1017.6
5/15/2025	39.1	1018.2	31.0	1016.8	88.4	1018.5	49.2	1010.6	48.1	1019.1	54.2	1018.3	68.7	1018.1
6/8/2025	38.9	1018.4	30.8	1017.1	88.2	1018.7	48.8	1011.0	47.9	1019.3	54.0	1018.5	68.2	1018.6

NM = Not Measured
ABD = Abandoned

Ric Davis

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Tuesday, June 17, 2025 1:25 PM
To: Ric Davis; Julia Upfal
Cc: Bob Doyle; Stephen R. Estey; Irit Walters
Subject: [EXTERNAL] Consultant Resumes
Attachments: Katy Lindstrom--master resume[68].pdf; Fran Thompson--master resume.pdf; MARK R ZAYATZ.pdf; Kyle Reidsma[67].pdf; Alyssa Wambold[82].pdf; DoyleBob_SGRes_MiningandReclamationPlanning.pdf

Dear Supervisor Davis,

In response to your request, attached to this email, please find resumes for the consultants advising Levy in our permitting efforts in Springfield Township. If there is anything else you seek, please let me know.

Regards,
Reuben

ALYSSA WAMBOLD, PE, PTOE

TRAFFIC ENGINEER

Alyssa applies her formal and on-the-job training to various road design and traffic-related projects including pavement management projects and traffic engineering services including traffic studies, crash analyses, pavement markings, signage, and MOT plans. She is very familiar with MDOT standards, ADA requirements, specifications, policies and procedures, as well as AASHTO standards and policies. She has practical experience in the development of road design plans, traffic staging concepts, temporary traffic control plans, freeway and non-freeway signing plans, traffic impact studies, and is proficient in MicroStation, HCS7, MiSigns, Synchro® and SimTraffic software.

YEARS OF EXPERIENCE

3 years — Fishbeck
10 years — total

EDUCATION

BS in Civil Engineering, Michigan Technological University

REGISTRATIONS/ CERTIFICATIONS

Professional Engineer – Michigan

Professional Traffic Operations Engineer

TRAINING

Pavement Surface Evaluation and Rating

EXPERIENCE

GOVERNMENTAL

MDOT | TRAFFIC AND SAFETY DIVISION

US-127 FREEWAY SIGN REPLACEMENT | ROSCOMMON AND CRAWFORD COUNTIES

Signing engineer for preparation of plans and specifications for permanent freeway signing of 30.8 miles of US-127, from the Clare/Roscommon County line to I-75 in Roscommon and Crawford Counties. Signing plans detail removal of existing signs and replacement of signs and supports in accordance with the MMUTCD, freeway signing design, placement and application guidelines, and MDOT traffic and safety notes. Plans included ramp signing and several specialty signs detailed using SignCAD.

I-94 MODERNIZATION ADVANCED BRIDGES FREEWAY SIGNING AND PAVEMENT MARKINGS

Project traffic engineer responsible for the permanent freeway signing and pavement marking plans. The project included reconstruction of eight bridges on I-94.

MDOT | GRAND REGION

I-96/FRUIT RIDGE IACR

Traffic engineer for operations and safety analysis of the I-96/Fruit Ridge Avenue interchange in Walker to evaluate the reconfiguration of the interchange. In addition to the interchange ramps, adjacent intersections were also reviewed to understand what impact the reconfiguration would have. Operations were evaluated using Highway Capacity Software and Synchro and reports were prepared to outline findings/recommendations to MDOT and FHWA. The project also included a review of historical crash data. This work was utilized to obtain an Interstate Access Change Request (IACR) by FHWA in coordination with MDOT.

MDOT | UNIVERSITY REGION

I-94 SIGNING | JACKSON TSC

Traffic engineer responsible for the development of permanent signing plans and updating inventory for all freeway and non-freeway signing upgrading and modifications. Project included reconstruction and rehabilitation of I-94, between M-60 and Sargent Road, including reconstruction of the M-106 interchange with dual roundabouts and truss and cantilever design with future widening considerations.

MDOT | METRO REGION

US-24 (ORCHARD LAKE TO LONG LAKE AND AT MAPLE ROAD) | OAKLAND TSC

Traffic engineer responsible for the preparation of MOT plans, detour routes, and specifications. Project included 2.5 miles of concrete milling and resurfacing and joint and curb and gutter repairs. Included stage plans for the Square Lake Road/US-24 intersection. Coordinated with the Metro Region design engineer and Oakland TSC staff. Project was part of Oakland TSC as-needed contract.

fishbeck

ALYSSA WAMBOLD, PE, PTOE

TRAFFIC ENGINEER

M-5 (I-275 TO PURDUE AVE) | OAKLAND TSC

Traffic engineer responsible for preparation of MOT plans, detour routes, specifications, and engineers estimate for road, bridge, and signing improvements. Project included 4.3 miles of CPM improvements, structure rehabilitation at Grand River Avenue and Drake Road, and freeway sign upgrades from 12 Mile Road through the I-96/I-275 interchange to M-102. Required extensive coordination with Metro Region design engineer, MDOT bridge design staff, Oakland TSC staff, and other consultants. Prepared permits for using local roads for detours. Project was part of Oakland TSC as-needed contract.

MDOT | SUPERIOR REGION

I-75 BL CPM RESURFACING | CITY OF ST. IGNACE

Design engineer for an as-needed design services contract for CPM resurfacing on 1.5 miles of I-75 BL in downtown St. Ignace. The northern 0.75 miles was converted from a 4-lane cross section to a 3-lane cross section with bike lanes. Also included ADA ramps, pavement markings, and MOT and pedestrian mobility during construction. (2018)

US-41 M-38 RESURFACING | ISHPEMING TSC

Design engineer for an as-needed design services contract for CPM resurfacing on 7 miles of US-41 in L'Anse and Baraga, and 1 mile of M-38 in Baraga. Also included culvert replacements, ADA ramps, guardrail replacement, pavement markings, and MOT. (2020)

M-26 US-41 CPM RESURFACING | ISHPEMING TSC

Design engineer responsible for as-needed design services contract for CPM resurfacing on 24 miles of M-26 from Phoenix to Copper Harbor and 3 miles of US-41 in Copper Harbor. Also included ADA ramps, guardrail replacement, pavement markings, and MOT. (2020)

US-41 CPM RESURFACING | ISHPEMING TSC

Design engineer for as-needed design services contract for CPM resurfacing on 5.3 miles of US-41 in Chassell and Houghton. Also included ADA ramps, guardrail replacements, pavement markings, and MOT. (2019)

US-41, M-26, AND M-203 VARIOUS REPAIRS | ISHPEMING TSC

Design engineer for as-needed design services contract for permanent repairs of flooding damage throughout Houghton County. Included pavement repair, guardrail replacements, culvert replacements, pavement markings, and MOT. (2019)

M-123 CPM RESURFACING

Design engineer for as-needed design services contract for CPM resurfacing on 12 miles of M-123 near Trout Lake. Also included extension of right turn lane at the intersection of M-28, ADA ramps, guardrail replacements, pavement markings, and MOT. (2018)

MDOT | BAY REGION

I-475/M-21 CORRIDOR STUDY

Traffic engineer for the development of a corridor study of I-475 from 5th Street (M-21) to Broadway Boulevard, and M-21 from Ann Arbor Street to Lapeer Road in the City of Flint. The study identified and evaluated short-, medium-, and long-term transportation system needs to enhance non-motorized mobility while maintaining vehicular operations at acceptable levels. A steering committee was created that included representatives of the City of Flint, Genesee County MPO, the CS Mott Foundation, the Flint Cultural Center, MTA, Mott Community College, the University of Michigan-Flint, and MDOT. Several alternatives were evaluated and included a road diet on M-21, conversion of the M-21 two-way pairs to bi-directional roadways, an at-grade I-475 through the project limits, and construction of a tunnel over I-475. A crash analysis was completed to identify areas of safety concern to be addressed with the proposed alternatives.

WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES (WCDPS) | DETROIT, MICHIGAN

CHERRY HILL ROAD REHABILITATION AND WIDENING (FROM CANTON CENTER ROAD TO EAST OF HAGGERTY ROAD)

Traffic engineer responsible for design for cold-milling, asphalt resurfacing, and widening

ALYSSA WAMBOLD, PE, PTOE

TRAFFIC ENGINEER

of just over two miles of Cherry Hill Road from two lanes to three lanes with continuous center left turn lane, added right turn lanes, and drainage improvements for Wayne County DPS. Also included signing and pavement markings, MOT plans, as well as partial enclosure of the North Branch of the Huston Drain, extensive MDEQ/EGLE permit issues, and utility coordination.

PINNACLE AEROPARK SIBLEY ROAD

Traffic engineer for reconstruction of Sibley Road in Huron Township. The project included intersection improvements, geometric improvements, proposed drainage, proposed culvert replacement, and permanent non-freeway signing and pavement markings. Responsible for MOT, signing, and pavement marking plans.

SIBLEY ROAD RECONSTRUCTION (TELEGRAPH ROAD TO RACHO ROAD)

Traffic engineer for MDOT LAP project for the reconstruction of Sibley Road to a 3-lane concrete roadway with curb and gutter and new enclosed drainage system between US-24 (Telegraph Road) east of Racho Road, as well as upgrading traffic signals at Racho Road to mast arms and permanent non-freeway signing and pavement markings. (2018-2019)

VAN HORN ROAD REHABILITATION (INKSTER ROAD TO ARSENAL ROAD)

Traffic engineer for MDOT LAP project for infrastructure improvements along .71 miles of Van Horn Road, including full-depth pavement reclamation, replacement of the box culvert at Smith Creek, ADA ramp upgrades, extensive utility coordination, permanent non-freeway signing and pavement markings. (2018-2019)

CHERRY HILL ROAD REHABILITATION AND WIDENING (FROM CANTON CENTER ROAD TO EAST OF HAGGERTY ROAD)

Design engineer for design for cold-milling, asphalt resurfacing, and widening of just over two miles of Cherry Hill Road from two lanes to three lanes with continuous center left turn lane, added right turn lanes, and drainage improvements for Wayne County DPS. Also included signing and pavement markings, MOT plans, as well as partial enclosure of the North Branch of the Huston Drain, extensive MDEQ/EGLE permit issues, and utility coordination. (2020)

CITY OF NOVI, MICHIGAN

PASER DATA COLLECTION

Engineer responsible for the annual PASER data collection using Roadsoft/Laptop Data Collector and reporting data to SEMCOG per TAMC requirements. GIS maps were created to show pavement conditions and pavement types. Comparison spreadsheets were updated to track changes in pavement conditions between rating cycles. A three-year capital improvement program for city-owned roads was developed, as well as strategies for partnerships with county and state stakeholders also owning roads within the city limits.

MEADOWBROOK ROAD (I-96 TO 12 MILE ROAD)

Traffic engineer responsible for MOT and signing plans, including detour route. Work included removing existing 5-inch HMA pavement and replacing it with 8-inch HMA pavement, repairing existing base as necessary, widening shoulders, and signing and pavement markings.

NOVI ROAD REHABILITATION (12 MILE ROAD TO 13 MILE ROAD)

Traffic engineer responsible for MOT, signing, and pavement marking plans. The project involved eliminating the center left turn lane for portions of the project and adding depressed landscaped bioswales in the center left turn lane to control turn movements and calm traffic. The remaining pavement was milled and resurfaced with HMA.

MEADOWBROOK ROAD (JN 132414) (I-96 TO 12 MILE ROAD)

Traffic engineer responsible for MOT and signing plans, including detour route. Work included removing existing 5-inch HMA pavement and replacing it with 8-inch HMA pavement, repairing existing base as necessary, widening shoulders, and signing and pavement markings. (2017)

NOVI ROAD REHABILITATION (12 MILE ROAD TO 13 MILE ROAD)

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TRAFFIC ENGINEER

Traffic engineer responsible for MOT, signing, and pavement marking plans in front of the busy retail area of Twelve Oaks Mall. The project involved eliminating the center left turn lane for portions of the project and adding depressed landscaped bioswales in the center left turn lane to control turn movements and calm traffic. The remaining pavement was milled and resurfaced with HMA.

NEIGHBORHOOD ROAD PROGRAM

Design engineer responsible for rehabilitation of seven asphalt and eight concrete neighborhood roads. Also included ADA ramps, pavement markings, and MOT. (2017)

EMMET COUNTY ROAD COMMISSION | HARBOR SPRINGS, MICHIGAN

TRAFFIC IMPACT STUDY AT INTERSECTIONS OF DIVISION ROAD/MITCHELL ROAD AND PLEASANTVIEW ROAD/HATHAWAY ROAD

Traffic engineer responsible for the modeling of the intersections of Division Road/Mitchell Road and Pleasantview Road/Hathaway Road, including calculating existing vehicle delays, levels of service, vehicle queues at the intersections, and the need for turn lanes and/or tapers. Completed signal warrants at the intersection of Division Road/Mitchell Road. Evaluated a potential roundabout at both intersections. Completed a crash analysis to identify potential crash patterns. Prepared a report documenting all analyses, findings, and recommendations.

GENESEE COUNTY METROPOLITAN PLANNING COMMISSION (GCMPC) | GENESEE COUNTY, MICHIGAN

TRAFFIC STUDY

Lead traffic operations engineer for the county-wide study of 3,600 federal-aid eligible intersections. Using an MDOT grant, the study evaluated the feasibility for roundabout implementation as a means of improving safety and traffic operations throughout the county. Technical analysis including microsimulation, as well as assessment of the ROW and surrounding features was performed to identify the most highly suitable intersections to be considered for future project planning. A final report and GIS data input was included with the final deliverables for use by all government agencies within the County.

TRAFFIC SAFETY STUDY

Traffic engineer for study and safety grant application on 12 intersections in the City of Flint, MI. The study compiled data from the Wayne State University Genesee County Traffic Study to identify the priority intersections. Analyzed existing crash data for serious injury and fatalities from UD-10 reports. Data was used to identify the type of safety hazard that existed at each intersection (signals, signage, right/left turns, etc.) This information was utilized to determine appropriate mitigation measures to improve safety at these locations. From this study, the following projects were funded for improvements: 12th Street/Van Slyke (signal upgrades and right- and left-turn geometric improvements; this intersection involves a railroad crossing and required a diagnostic safety review by the railroad); Miller/Ballenger (signal upgrades and to interconnect control with Genesee County Road Commission); and Dort/Stewart (geometric improvements for right- and left-turn and signal upgrades).

TRAFFIC SAFETY STUDY

Traffic engineer for study and safety grant application on eight intersections within the City of Burton, MI. The study compiled data from the Wayne State University Genesee County Traffic Study to identify priority intersections. Analyzed existing crash data for serious injury and fatalities from UD-10 reports. Data was used to identify the type of safety hazard that existed at each intersection (signals, signage, right/left turns, etc.) This information was utilized to determine appropriate mitigation measures to improve the safety at these locations. From this study, the following projects were funded for improvements: Lapeer/Belsay (geometric improvements for right- and left-turn/signal improvements); and Bristol/Camden (signal improvements).

US-23 CORRIDOR TRAFFIC STUDY

Fishbeck is a subconsultant for this ongoing project studying the US-23 corridor between Owen Road and Bristol Road. The study includes analysis of several interchange alternatives,

ALYSSA WAMBOLD, PE, PTOE

TRAFFIC ENGINEER

including one mile in each direction from US-23 along the following corridors: Hill Road, Grand Blanc Road, Thompson Road, North Road, Torrey Road, Silver Lake Road, and Owen Road. The goals of the study are to identify both short and long term options to improve the operational efficiency, reliability, and safety for all users of the US-23 corridor.

SAGINAW COUNTY ROAD COMMISSION | SAGINAW, MICHIGAN

SEYMOUR ROAD (BELL TO DORWOOD ROAD, TAYMOUTH TOWNSHIP)

Traffic engineer responsible for development of plans, specifications, and estimates. Project included design of 1.6 miles of HMA crushing/shaping, shoulder widening, signing, pavement markings, and maintaining traffic plans.

CITY OF TAYLOR, MICHIGAN

PASER RATING

Engineer responsible for the collection of PASER condition ratings using Roadsoft/Laptop Data Collector for the entire city-owned street network, along with creation of condition maps and reporting to SEMCOG.

BEECH DALY ROAD REHABILITATION

Design engineer for MDOT LAP project for re-paving approximately 8,000 feet of 2-lane (24-foot-wide) asphalt, over concrete base. The project also consisted of repairing the concrete base as needed, placing HMA overlay, installing new ADA ramps, repairing concrete curb and gutter, replacing and grading asphalt and aggregate shoulders, and other miscellaneous work. Responsible for project design including MOT plans and proposed detour route. (2016)

CANTON TOWNSHIP, MICHIGAN

NEIGHBORHOOD ROAD PROGRAM AND PAVEMENT MANAGEMENT

Design engineer responsible for the analysis of existing road conditions using PASER ratings and development of a 2-year capital improvement program. Also included design of a program to address catch basin, drainage, and major safety issues on neighborhood roadways. (2019)

CITY OF NORTHVILLE, MICHIGAN

PAVEMENT MANAGEMENT PLAN

Design engineer responsible for collection of PASER ratings and report development that provided a summary of observations of road conditions throughout the Northville pavement network and predicted required repairs and costs for each roadway to keep roads at an acceptable condition level over 10 years.

CITY OF HUNTINGTON WOODS, MICHIGAN

PASER RATING AND ASSET MANAGEMENT

Engineer responsible for the collection of PASER conditions ratings using Roadsoft/Laptop Data Collector for the entire city-owned street network, along with creation of condition maps and reporting to SEMCOG. A report was developed that summarized the observations and findings of road conditions throughout the Huntington Woods pavement network and predicted required repairs and costs to keep roads at an acceptable condition level over 15 years, in anticipation of a millage proposal.

WATERFORD TOWNSHIP, MICHIGAN

NON-MOTORIZED PATHWAYS

Engineer responsible for videotaping all sidewalk and non-motorized pathways in the township with a GPS-enabled camera and reviewing the videos to determine a pavement rating for each segment of sidewalk or pathway. This work also included tracking safety concerns, drainage issues, and ADA-compliance issues. All ratings and areas of concern were georeferenced from the videos, and maps were created using ArcGIS. Videos were linked to each sidewalk segment in ArcGIS, allowing a user to click on any segment in ArcGIS and the video would automatically open.

ALYSSA WAMBOLD, PE, PTOE

TRAFFIC ENGINEER

FOWLERVILLE, TRENTON, HASLETT, AND CLAWSON COMMUNITY SCHOOLS, MICHIGAN

PASER RATING

Engineer responsible for evaluating and creating pavement condition assessment for several schools in each District, including parking lots, sidewalks, curb, gutter, and pathways.

CITIES OF BERKLEY, OAK PARK, AND HUNTINGTON WOODS, MICHIGAN

MULTI-COMMUNITY PLANNING

Engineer responsible for the development of a technical memorandum outlining potential traffic shifts, lane reductions, and green infrastructure opportunities on Coolidge Highway, from Nine Mile Road to 12 Mile Road and on 11 Mile Road, from Greenfield Road to Woodward Avenue in the communities of Berkley, Oak Park, and Huntington Woods. Identified potential funding sources to implement these improvements. Project included several public input sessions. Presented the findings of the report to each city council/ commission.

CITY OF LINCOLN PARK, MICHIGAN

PASER RATING

Engineer responsible for the collection of PASER condition ratings using Roadsoft/Laptop Data Collector for the entire city-owned street network, along with reporting to SEMCOG.

CITY OF WOODHAVEN, MICHIGAN

PASER RATING

Engineer responsible for the collection of PASER condition ratings using Roadsoft/Laptop Data Collector for the entire city-owned street network, along with reporting to SEMCOG.

CITY OF DEARBORN, MICHIGAN

LOCAL STREET EVALUATION

Engineer responsible for the collection of PASER condition ratings using Roadsoft/Laptop Data Collector for the entire city-owned street network. City-maintained roads totaled 271 miles and included 137 miles of asphalt and 134 miles of concrete pavement. Asset management plans and a compliance plan was developed for all roadways and bridges owned by the City in accordance with TAMC requirements. The city-owned parking lots and alleyways were also evaluated and inventoried.

PRIVATE DEVELOPMENT

CUNNINGHAM LIMP | DETROIT, MICHIGAN

DETROIT COUNTRY DAY LOWER SCHOOL TRAFFIC STUDY

Traffic engineer responsible for creating the Synchro model for expansion of the Detroit Country Day Lower School. The existing and proposed levels of service were determined from the Synchro model. Recommendations for improvements to internal traffic operations and driveway locations were developed.

SMM

LIVERNOIS STREETSCAPE TRAFFIC STUDY

Traffic engineer responsible for creating the Synchro model for a potential road diet on Livernois Road from 8 Mile Road to Margareta Avenue. The existing levels of service were determined from the Synchro model, then compared to projected levels of service for a road diet scenario and a no-build scenario.

SDG ASSOCIATES

DETROIT EIGHT PRECINCT TRAFFIC STUDY

Traffic engineer responsible for analyzing traffic data and preparing a traffic study for the proposed 2-unit building. Levels of service were determined using the Highway Capacity Software.

FAITH BAPTIST CHURCH

ALYSSA WAMBOLD, PE, PTOE

TRAFFIC ENGINEER

TRAFFIC STUDY

Traffic engineer responsible for analyzing traffic data and preparing a traffic study for the proposed church building. Levels of service were determined using the Highway Capacity Software.

COVENANT HEALTHCARE | SAGINAW, MICHIGAN

TRAFFIC IMPACT STUDY

Traffic engineer responsible for using Synchro and SimTraffic software to determine the impacts of the expansion of the Covenant Healthcare campus. Analyzed traffic data and calculated levels of service for existing, background, and future conditions. Completed a crash analysis, including pedestrians and bicycles. Wrote traffic analysis report, pedestrian access plan, and wayfinding signage plan outlining findings.

SEEFRIED PROPERTIES | PONTIAC, MICHIGAN

TRAFFIC IMPACT STUDY AT PROPOSED AMAZON FULFILLMENT AND DISTRIBUTION CENTER

Traffic engineer responsible for the modeling of 15 intersections near the site, including calculating existing vehicle delays, levels of service, and vehicle queues at the intersections. Also calculated future vehicle delays, levels of service, and vehicle queues (after the site was redeveloped). Completed signal warrants at multiple intersections and a crash analysis for requested intersections. Prepared a report documenting all analyses, findings, and recommendations (ongoing).

ARCADIS | DETROIT, MICHIGAN

CULTURAL CENTER PLANNING INITIATIVE TRAFFIC STUDY

Lead traffic engineer for the analysis of 40 intersections surrounding the Detroit Institute of Arts in Mid-Town Detroit as a part of an overall area plan to create a more pedestrian friendly cultural center campus that included the DIA, Detroit Public Library, Detroit Historical Museum, Michigan Science Center, and Charles H. Wright Museum. Analysis included existing conditions (2020), background conditions (2030), and proposed future conditions. Future conditions included lane reductions along M-1 and Warren Avenue and closure/ limited access of John R, Putnam, Farnsworth, and Kirby. To improve levels of service, at a key intersection, the removal of direct lefts at the intersection of M-1 and Warren and widening of the median on Warren to allow for a "Michigan Left".

SAROKI ARCHITECTURE | BIRMINGHAM, MICHIGAN

TRAFFIC IMPACT STUDY FOR PROPOSED MULTI-FAMILY DEVELOPMENT

Traffic engineer responsible for preparation of a traffic impact study in the City of Birmingham for a proposed residential development on South Eton Road, adjacent to the existing District Lofts Phase 2 building. The parcel was occupied by a banquet facility (The Reserve Birmingham). The traffic impact study included the completion of a crash analysis for the most recent five years of data for the roadways adjacent to the proposed development. Following the analysis, a report was prepared documenting all analyses, findings, and recommendations.

MCA | MERIDIAN TOWNSHIP, MICHIGAN

TRAFFIC IMPACT STUDY FOR A PROPOSED MENARD'S STORE

Traffic engineer responsible for the completion of a crash analysis for the most recent five years of data for the road segments adjacent to the proposed property. Crash data was filtered to remove crashes that occurred in the median crossovers that MDOT removed during their 2019 construction project. Prepared a report documenting all analyses, findings, and recommendations. (2019-2020)

ANN ARBOR ROAD OUTLET, LLC | PLYMOUTH, MICHIGAN

TRAFFIC IMPACT STUDY FOR PLYMOUTH MARKET PLACE

Traffic engineer responsible for the modeling of four intersections near the site and four site driveways, including calculating existing vehicle delays, levels of service, and vehicle queues

at the intersections. Also calculated future vehicle delays, levels of service, and vehicle queues (after the site was redeveloped). Completed signal coordination along Ann Arbor Road (Old M-14) corridor. Completed signal warrants at site driveway. Prepared a report documenting all analyses, findings, and recommendations.

BILTMORE DEVELOPMENT | PITTSFIELD TOWNSHIP, MICHIGAN

TRAFFIC IMPACT STUDY FOR PROPOSED RESIDENTIAL DEVELOPMENT

Traffic engineer responsible for the modeling of two intersections near the site and two proposed driveways, including calculating existing vehicle delays, levels of service, and vehicle queues at the intersections. Also calculated future vehicle delays, levels of service, and vehicle queues. Completed a crash analysis for all roadways bordering the site. Prepared a report documenting all analyses, findings, and recommendations. (2019-2020)

ENVIAH | SAGINAW, MICHIGAN

TRAFFIC IMPACT STUDY

Traffic engineer responsible for using Synchro and SimTraffic software to determine the impacts of the expansion of the Enviah campus. Analyzed traffic data and calculated levels of service for existing, background, and future conditions. Completed a crash analysis, including pedestrians and bicycles. Wrote traffic analysis report, pedestrian access plan, and wayfinding signage plan outlining findings.

NORTHVILLE HILLS GOLF CLUB | NORTHVILLE, MICHIGAN

STREET REPAIR

Engineer responsible for preparing construction documents and performing construction engineering services to rehabilitate several residential streets within the golf club, including curb and gutter repairs, localized asphalt pavement repairs on more than 9.5 miles of two-lane streets with 46 existing sidewalk ramps. The work involved repairing and replacing catch basins or storm sewer manholes, installing new ADA ramps where affected by repairs, HMA pavement repairs, and restoration. (2017-2019)

PAVEMENT MANAGEMENT PLAN

Engineer for development and implementation of the long-term pavement management for Northville Township and the NHGC home owners association (HOA). Worked with the HOA to finalize the 10-year pavement management program to assist the HOA in determining what financial contribution they may wish to budget annually. (2017-2019)

PHEASANT RUN ROADWAY MAINTENANCE ASSOCIATION | CANTON TOWNSHIP, MICHIGAN

PAVEMENT MANAGEMENT PROGRAM

Provided a 10-year pavement management program for a residential roadway maintenance association. The initial pavement management evaluation consisted of inspecting, rating, and documenting all of the existing conditions of the residential roads for three subdivisions; performing pavement cores and material testing to review the existing soils; developing a 10-year program using pavement management software; and preparing the final report including evaluation/analysis and work plans. Also provided design and construction engineering services on a yearly basis for the program's repair projects. (2016-2019)

ROMULUS PARK AND FLY | ROMULUS, MICHIGAN

TRAFFIC STUDY

Traffic engineer using Synchro for traffic study for the redevelopment of an existing unused parking lot at a factory into an off-site parking facility near Detroit Metropolitan Airport. Analyzed traffic count data, calculated levels of service, and wrote traffic analysis report. (2017)

DETROIT COUNTRY DAY | BLOOMFIELD TOWNSHIP, MICHIGAN

LOWER SCHOOL TRAFFIC STUDY

Traffic engineer using Synchro and SimTraffic for the traffic study of the expansion of the Lower School. Analyzed traffic data, calculated levels of service, and wrote traffic analysis

ALYSSA WAMBOLD, PE

TRAFFIC ENGINEER

report. Prepared recommendations for improvement of site circulation, and modifications to driveway locations. (2017-2018)

WOODLAND MALL | KENTWOOD, MICHIGAN

TRAFFIC STUDY

Traffic engineer using Synchro and SimTraffic for the traffic study for the renovations to the Woodland Mall. Analyzed traffic data for surrounding streets and internal service drives, and calculated levels of service and wrote traffic analysis report. Prepared recommendations for improvement of site circulation and modifications to driveway locations. (2017-2018)

MASS TRANSPORTATION AUTHORITY | FLINT, MICHIGAN

TRAFFIC STUDY

Traffic engineer using Synchro for the traffic study for the redevelopment of a parking garage. Analyzed traffic count data, calculated levels of service, and wrote traffic analysis report. (2018-2019)

ST. JOHN MACOMB HOSPITAL | WARREN, MICHIGAN

PARKING STUDY

Traffic engineer for parking study for the renovations at the hospital. Parking lot occupancy rates were determined at multiple times of day. Current parking lot capacity was evaluated to determine if it met current standards. (2017)

PRINCIPAL, SENIOR LANDSCAPE ARCHITECT

BOB DOYLE

PLA, ASLA

Bob Doyle has been involved in a wide range of planning and development experience throughout his career. Joining SmithGroup in 1985, Bob spent 11 years successfully serving clients as a project manager and landscape architect on various site development projects. In 1996, Bob took a position with a mining company, one of SmithGroup's clients, and spent the next 10 years working in the private sector managing planning, engineering and development of property, residential home construction, and land reclamation. As a member of the management team of the mining company, he was involved in site acquisition, permitting and public relations, redevelopment planning, reclamation design, mining planning, environmental cleanup activities, and bidding and construction management of earth moving and landscape efforts.

Bob returned to SmithGroup in 2006 and has continued building his expertise in mining and reclamation planning. His understanding of the mining industry, coupled with his skills as a site planner and community facilitator, provide a unique set of skills for assisting clients with challenging resource extraction related projects. Many of the project's Bob planned in the early years of his career are now successfully reclaimed and redeveloped and stand as important land use assets in their communities.

EDUCATION

Bachelor of Landscape Architecture, Michigan State University

REGISTRATIONS

Landscape Architect:
Michigan

Residential Builder:
Michigan

PROFESSIONAL AFFILIATIONS

American Society of Landscape Architects

Michigan Chapter Government Affairs, Vice President

HART PACKING COMPANY

Hart, Michigan. Mining and reclamation plans for an existing sand mine located in a critical dune area of Lake Michigan.

HARTLAND SAND & GRAVEL

Hartland, Michigan. Prepared an EA that evaluated the potential environmental and community impacts of a new sand and gravel operation proposed in rural southeastern Michigan. Efforts included the preparation of permitting documents, and participation in presentations and public hearings necessary to obtain the permits for mining. During the period of mining activity, revisited the site to prepare a land use redevelopment plan and final reclamation guidelines.

LONDON SAND

Milan, Michigan. Evaluated the potential environmental impacts and permitting requirements for the expansion of an existing sand pit and limestone quarry.

MILFORD SAND & GRAVEL

Milford, Michigan. Prepared an EA that evaluated the potential environmental and community impacts of proposed expansion of a sand and gravel operation. Prepared permitting documents, participated in presentations and public hearings, and negotiated an amended consent agreement necessary to obtain the permits for mining. At the conclusion of mining activity, revisited the site to prepare a land use redevelopment plan and final reclamation guidelines.

WALLACE STONE

Bay Port, Michigan. Developed site plans outlining final mining and reclamation activities for an 1,100 acre stone quarry, and worked with local planning and elected officials to obtain permit approval.

HOLLY SAND & GRAVEL

Holly, Michigan. Assessed remaining aggregate reserves, site conditions, and reclamation requirements to prepare post-mining development scenarios and reclamation approaches.

U.S. SILICA

Rockwood, Michigan. Conducted on-site assessment of natural features and prepared state regulatory permit application documents for expansion of stone quarry.

WATERSTONE DEVELOPMENT

Oxford, Michigan. Created redevelopment plans for a residential lakeside golf community on a 1,000-acre previously reclaimed sand and gravel mine site.

BAY HARBOR RESORT

Bay Harbor, Michigan. Provided preliminary land planning services for a 1,000-acre residential resort. Also provided site planning services for specific residential development areas and open space amenities including entrance areas, waterfront promenades, the yacht club, and the village entry streetscape. Developed schematic land plans for the village center in the traditional neighborhood development vernacular.

HERITAGE DEVELOPMENT

Indianapolis, Indiana. Developed reclamation plans for a large sand and gravel operation as well as a post-mining development master plan that proposed 400-600 new homes around a series of mining created lakes.

MONTOYA PARCEL

Durango, Colorado. Prepared reclamation strategies and land use development alternatives for a sand and gravel operation. Evaluated regional land use and development patterns, transportation networks, and significant site constraints in creating a framework for future land reuse.

MORGAN LAKE ESTATES

Brighton, Michigan. Land planning services for the reclamation and residential redevelopment of an existing sand and gravel operation.

PROJECT SABLE

Jackson County, Missouri. Prepared mining and reclamation plans to create a lake amenity for a multi-use property development. Worked with a selected mining operator and the land owner to create a feasible plan for mining while meeting land development goals.

ISLAND LAKE OF NOVI

Novi, Michigan. Land planning, final land reclamation, zoning amendments, and public approval process of an 876-home residential unit development surrounding a 170-acre lake created by sand and gravel mining. Reclamation activities included cleanup of an environmental site, (a former orchard), to meet residential standards.

KENT LAKE ROAD SITE

South Lyon, Michigan. Provided land planning services, environmental cleanup, and reclamation of a 230-acre site following conclusion of industrial activities. An elementary school has been developed on the site, and the anticipated use of the remaining site is multi-family and single-family residential, focused on lakes created by the mining activity and preserved natural features.

OAKLAND SAND AND GRAVEL

Oakland Township, Michigan. Interim and final reclamation of ongoing mining operation. Facilitated expansion of mining activity onto adjacent land, prepared permitting documents (including an assessment of community impacts), participated in presentations and public hearings, and negotiated an amended consent agreement.

SALEM SAND & GRAVEL

Independence Township, Michigan. Final land reclamation of property for future residential development and cleanup of environmental contamination.

STONELEIGH

Highland, Michigan. Provided land planning and reclamation design services for a 678-home traditional neighborhood development on an 850-acre site. Prepared extensive permit documentation to facilitate the complete revision of the previously approved (but technically infeasible) mining and development permit. Revisited project during the last five years of operations to further refine the mining, reclamation, and redevelopment plans.

MAPLE LAKE FARMS

Milford, Michigan. Land planning, mining guidelines, and reclamation design for the creation of a 31-lot, clustered, open space neighborhood. Managed plat preparation, mine reclamation and construction of the project entry road.

D-BAR-A SITE

Metamora Township, Michigan. Prepared a community impact assessment, mining and reclamation plans, and site plan submittal for a new sand and gravel operation.

HOLLY DISPOSAL

Holly, Michigan. Assessed reclamation needs and redevelopment potential for sand and gravel operation in final stage of extraction.

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FRAN THOMPSON

Ecologist

EXPERIENCE

Fran is an experienced field technician and project manager, specializing in wetland delineation, wetland mitigation monitoring, permitting, global positioning system (GPS) operation, geographic information systems (GIS), and AutoCAD. She is well-versed in the identification of plant species and plant communities in the Great Lakes Region and has an understanding of hydric soil indicators. Fran also develops grading and planting plans for wetland mitigation areas, floodplain review, and stream restoration. In addition, she assists clients with Michigan Department of Environment, Great Lakes, and Energy (EGLE) Part 301, Part 303, and Part 31 permit applications. At Barr, she:

- Supports characterization of environmental resources, impact assessments, and project permitting and compliance.
- Completes wetland delineations and in-field streams evaluations, protected species assessments, and other ecological field investigations to support the development of EGLE permit applications.
- Performs botanical inventories, functional assessments, protected species habitat reviews, and ecological restoration monitoring.
- Performs desktop reviews of topography, soils, streams, land use/cover, National Wetland Inventory, and protected species databases.
- Completes assessments of environmental impacts, prepares applications and reports required for implementation of projects and mitigation of impacts, prepares restoration planning documents, and works with clients and regulatory agencies to resolve ecological and regulatory issues for projects.

Education
BS, Fisheries and Wildlife; Conservation Biology, Michigan State University, 2016

Certification
Wetland Delineator (38-hour Army Corps of Engineers Wetland Delineation Training)

Commercial Pesticide Applicator License, Aquatic (2019)

ISA Certified Arborist MI-4753A

Digital skill set
Trimble GIS, ArcView, AutoCAD

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FRAN THOMPSON

Project work

Confidential utility client; wetland delineations; Michigan; task lead, lead wetland delineator

- Led a wetland delineation field team for a proposed solar energy project encompassing an approximately 2,000-acre area at an approximately 800-acre industrial site in Michigan.

Panattoni Development Company; wetland delineation; Van Buren Charter Township, MI; task lead

- Led a team tasked with delineating wetland and streams for a 282-acre site. Responsibilities included wetland delineation, post-processing GPS data, coordinating the production of a wetland boundary map, and communicating with the client on the results of the wetland delineation.

Confidential client; wetland delineation; Canton Township, MI; team member

- Assisted with the delineation of an on-site wetland and located wetland boundaries with GPS alongside Ford and Gorman Roads in Canton Township, Michigan. Her responsibilities included post-processing GPS data and producing a wetland boundary map using AutoCAD.

Confidential developer client; wetland permit application for commercial development; Huron Township, MI; task lead

- Obtained wetland permits for the construction of a commercial development. Responsible for filling out the permit application encompassing Phase 1 impacts at the site.

Pokagon Band of Potawatomi Indians; wetland monitoring; Van Buren County, MI; team member

- Organized wetland monitoring within 18 acres of wetland mitigation constructed for the Pokagon Band of Potawatomi Indians. Monitoring tasks included establishing a monitoring protocol, conducting herbaceous vegetation monitoring, and conducting tree counts of established and newly planted trees. She also compiled the first-year monitoring report and associated graphics and tables.

AEW and NHT; tree survey and wetland delineation; Novi, MI; team lead

- Fieldwork team leader for wetland delineation and tree survey for a proposed three-mile sanitary sewer rehabilitation.

Confidential mining client; ecological survey; Michigamme Township, MI; team member

- Conducted ecological surveys as required for yearly monitoring at the client's project site. Responsibilities included conducting a small mammal survey, monitoring upland vegetation within the project site, and monitoring wetland vegetation within a reference wetland.

Confidential mining client; baseline ecological survey; Northern Michigan; team member

- Serving as a member of a project team responsible for conducting a baseline ecological survey at a proposed mine project site and surrounding reference areas. Her responsibilities included conducting a small mammal survey, monitoring upland vegetation within the project site, and monitoring wetland vegetation within a reference wetland. She was also responsible for compiling baseline survey data and information into a baseline report to comply with the mining permit reporting standards.

AEW; tree survey; Orion Township, MI; project manager, arborist

- Served as project manager and field lead of a project team charged with inventorying trees on a 70-acre site in advance of the construction of a new residential development. Inventory included identifying

approximately 8,000 trees to species, recording diameter at breast height (DBH), locating trees with GPS, and post-processing data to compile an inventory list.

KLA; tree inventory and stream restoration; Ann Arbor Township, MI; team member

- Served as a member of a project team charged with inventorying trees on a 17.8-acre site in Ann Arbor Township, Michigan, in advance of the construction of a new facility for KLA. Inventory included identifying approximately 1,700 trees to species, recording diameter at breast height (DBH), locating trees with GPS, and post-processing data to compile an inventory list. In addition to the tree inventory, she also served on the team charged with stream restoration on the site. Her responsibilities included producing drawings for agency review showing proposed restoration activities, surveying bankfull cross-sections of the existing stream, and EGLE permitting assistance.

Confidential client; floodplain permit; Pentwater, MI; team member

- Serving as a member of a team tasked with applying for a floodplain permit to allow for the construction of a waterfront home in Pentwater, Michigan, she was responsible for the design and production of a grading plan for agency review.

Multiple clients; invasive species management; Michigan; team member

- Identifying and treating invasive species within wetland mitigation sites across Southeast Michigan.

Training

- 38-hour Army Corps of Engineers Wetland Delineation Training, Richard Chinn Environmental Training, Inc. (2019)
- Shoreline restoration training, Michigan Department of Environment, Great Lakes, and Energy (2018)

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KATY LINDSTROM, PE

Vice President, Senior Environmental Engineer

EXPERIENCE

Katy has 16 years of experience helping clients address groundwater management issues, achieve environmental compliance, and assess and remediate contaminated sites in Michigan and throughout North America. She specializes in groundwater-flow and contaminant fate-and-transport modeling and has experience designing and managing investigations to characterize geology and hydrogeology. Katy assists her clients with complex projects, navigating multiple Michigan regulatory frameworks with regulators across different divisions in the Michigan Department of Environment, Great Lakes, and Energy (EGLE). In 2023, Katy was appointed by Governor Gretchen Whitmer to serve on the Michigan Water Use Advisory Council, representing professional hydrologists and hydrogeologists with hydrogeology field experience. The Water Use Advisory Council was established under Michigan Part 328 (Aquifer Protection) to study and make recommendations to state agencies on Michigan's Water Use Program. Katy currently serves as the Co-Chair of the council's Models Committee and as a member of a workgroup to improve site specific reviews in accordance with Michigan Part 327 (Great Lakes Preservation) of Michigan's Natural Resources and Environmental Protection Act.

Her work for mining clients in Michigan ranges from operational assistance and closure planning for a subaqueous tailings disposal facility to engineering design to prevent secondary wetland impacts from quarrying operations in northern Michigan to Michigan Part 303 (Wetlands Protection) and Part 301 (Inland Lakes and Streams Protection) permitting assistance for expanding and new sand and gravel mines in southeast Michigan.

Education
MS, Hydrologic Science and Engineering, Colorado School of Mines, 2009

BS, Environmental Engineering, Michigan Technological University, 2006

Registration
Environmental Engineer: Michigan, Illinois

Certification
40-Hour HAZWOPER, 24-Hour MSHA

KATY LINDSTROM, PE

Confidential mining client; groundwater cutoff wall design; Michigan; project manager

- Managed a Barr team and led the design of a subsurface groundwater cutoff wall to limit the flow of groundwater to a proposed open-pit mining operation in northern Michigan and mitigate potential impacts to wetlands in accordance with EGLE Part 303 wetland regulations.

Confidential sand and gravel mining company; mine expansion planning; southeastern Michigan; project manager

- Managed a Barr team performing services to support expansion planning, including both the expansion of existing mine facilities and new greenfield developments. Barr's work includes baseline characterization of environmental resources, impact assessments, hydrogeological evaluations (including numerical groundwater flow modeling), reporting, and permitting assistance.

Confidential sand and gravel mining company; mine permitting; southeastern Michigan; project manager

- Prepared and submitted permit applications for lake creation in accordance with EGLE Part 301 regulations. During the permitting process, communicated with EGLE staff regarding technical, hydrogeological information to successfully obtain renewed permits for three sand and gravel mines in Michigan.

Confidential industrial client; risk management evaluations; Michigan; technical lead

- Assisted an industrial client with risk management evaluations related to various water withdrawals from both a shallow, unconsolidated aquifer and a deeper, semi-confined bedrock aquifer near a shallow groundwater contamination plume. Work included screening-level groundwater flow modeling, developing and implementing monitoring programs with in-well data-logging water-level sensors, well location siting, and water appropriations registration.

Confidential mining client; integrated groundwater/surface-water model for subaqueous tailings disposal facility; Michigan; project manager and technical lead

- Oversaw the groundwater modeling team for an integrated groundwater/surface-water model of a subaqueous tailings disposal facility at a mining facility in Michigan. Conducted hydrogeologic evaluation; developed a conceptual site model; directed groundwater model and contaminant fate-and-transport model development, calibration, and uncertainty analysis; and conducted communication with the client and regulators. Provides ongoing support for operations, environmental compliance, and closure planning.

Confidential mining client; groundwater-flow modeling for proposed mining project; northern Minnesota; individual contributor

- Performed groundwater-flow modeling to estimate potential water quality impacts for a proposed mining project in northern Minnesota. Modeling efforts included assisting with the development of a regional-scale groundwater flow model and calibration of two local-scale models focused on the mine pit and tailings disposal areas. Following calibration, predictive simulations were completed to estimate groundwater inflow rates to mine pits and seepage loss from a tailings basin over time. The model results were used to develop two integrated surface water/groundwater models for the proposed project area. Additionally modeled unsaturated water flow beneath a tailings basin pond to estimate tailings saturation conditions and support assumptions for water-quality modeling to estimate constituent release from tailings material.

Confidential client; remedial action planning for CCR facilities; Michigan; project manager and engineer-of-record

- Managed a Barr team and served as the hydrogeology technical lead for two separate coal combustion residual (CCR) facilities that are undergoing remedial action planning to address groundwater impacts

KATY LINDSTROM, PE

related to CCR disposal in historical, unlined ash ponds near surface water bodies. Provided technical and regulatory consulting for these complex projects, including communications with EGLE staff in three divisions (Material Management Division, Water Resources Division, and Remediation and Redevelopment Division), two district offices, three Technical and Program Support Teams, and the Remediation Advisory Team to build consensus as the projects advanced and streamline remedial action plan approval. Multiple remedial options were evaluated, and remedial action plans are currently under development for both facilities. Remedies are expected to include source removal, constructed treatment wetlands, and a permeable reactive barrier.

Confidential client; basis of design evaluation for remedial cutoff wall; Michigan; technical lead

- Oversaw the development of a groundwater flow model to provide the technical basis for design of a low-permeability, subsurface cutoff wall as part of an interim remedial action to contain PFAS impacts in groundwater in the source area of a manufacturing facility. Provided technical direction to project leadership and groundwater modeling staff and technical quality review of final deliverables, leading to successful approval of the interim remedial action by EGLE. Groundwater modeling was used as the basis of design of the cutoff wall, and contractor bidding for construction of the cutoff wall is currently underway.

Confidential client; remediation of impacted river sediments adjacent to former MGP site; Michigan; technical lead

- Served as a technical lead for the investigation, evaluation, design, permitting, and remediation of impacted river sediments adjacent to a former MGP site on the Flint River in Michigan. The project had significant schedule constraints and multiple stakeholders involved for most facets of the project. Served a key role in communicating with the client and stakeholders. Oversaw the technical teams for geological and groundwater modeling and design of an engineered sediment cap. The project was successfully substantially completed in 2017 with restoration work continuing in 2018.

Confidential clients; groundwater-surface water interface compliance; Michigan; technical lead

- Assisted clients with environmental compliance at the groundwater/surface-water interface in accordance with MDEQ Part 201 rules. Through a combination of hydrogeologic data collection and groundwater-flow modeling to assess the groundwater/surface-water interface, completed mixing-zone determination requests for three different sites in Michigan to establish site-specific criteria and one successful "de minimis" determination to demonstrate negligible water-quality impacts after groundwater mixing with surface water.

Affiliations

- Michigan Water Use Advisory Council, Member
- American Institute of Professional Geologists, Michigan Section, Associate Member

Training

- 40-Hour HAZWOPER Training and 8-Hour Annual Refresher Courses
- 24-Hour MSHA Surface Miner Training, New Miner Training and 8-Hour Annual Refresher Courses

KYLE REIDSMA, PE, PTOE

VICE PRESIDENT | SENIOR TRAFFIC ENGINEER | PROJECT MANAGER

Kyle's experience includes a variety of traffic engineering projects including MOT design, pavement marking and signing design, traffic simulation, and traffic impact studies, with a specific emphasis on traffic signal systems design and operations for a wide variety of projects and clients in Michigan and beyond. He has been responsible for traffic signal design and review for over 900 devices in his career ranging in complexity from warning sign flashers to adaptive systems and complex interchanges like SPUIs and DDIs. He also has experience in the planning and analysis of roundabout intersections.

YEARS OF EXPERIENCE

6 years — Fishbeck
24 years — total

EDUCATION

BS in Civil Engineering, Calvin College

REGISTRATIONS/ CERTIFICATIONS

Professional Engineer - Michigan, Indiana, Ohio

Professional Traffic Operations Engineer

MEMBERSHIPS

Institute of Transportation Engineers

TRAINING

FHWA NHI-3800069 Road Safety Audits/Assessments

Ohio Traffic Signal Academy

EXPERIENCE

MDOT | MICHIGAN

STATEWIDE AS-NEEDED TRAFFIC SIGNAL DESIGN

Project Manager for Fishbeck's contract for MDOT's statewide as-needed traffic signal design services. Services included coordination with MDOT, stakeholders, subconsultants, and utility companies to provide design services for traffic signal improvements as part of stand-alone or road design projects. Multi-disciplinary design included traffic signals, maintenance of traffic, sidewalk ramps, survey, geotechnical investigation, and subsurface utility exploration with the latter two services provided by subconsultants. These projects typically included modernizing traffic signals or operational improvements to existing signals, including new signals, phasing, supports, controller and cabinets, vehicular and pedestrian detection, and ADA-compliant sidewalk ramps. As-needed signal designs have included the following projects:

- JN 212541: M-43 at Nixon; City of Grand Ledge
- JN 210817: I-196BS at Godfrey, Havana and Clyde Park; City of Wyoming
- JN 213521: M-100 at Taylor; City of Grand Ledge
- JN 213308: M-59 at Oak Grove; City of Howell
- JN 215774: US-31 at Pickerel Lake Road; Bear Creek Township
- JN 217734: I-196BS at Clyde Park; City of Wyoming
- JN 214175: I-94 at State Street; City of Ann Arbor
- JN 214187: I-94 at Ann Arbor/Saline Road; City of Ann Arbor
- JN 218999: M-46 at Carr Road; Egleston Township
- JN 220947: US-223 at Division Street, City of Adrian

TRAFFIC SIGNAL MODERNIZATION, OAKLAND COUNTY

Project Manager for Fishbeck's contract for an MDOT traffic signal modernization project at seven intersections throughout Oakland County. The project included survey, design, geotechnical engineering, and subsurface utility engineering. The design work included traffic signals, sidewalks, maintenance of traffic, signing, and pavement markings. Fishbeck worked with MDOT to provide utility coordination including obtaining existing plans, setting up field meetings, and developing a utility conflict matrix. Traffic signal improvements were new box-span configurations including strain poles, LED signal heads, pedestrian countdown timers, pushbuttons, video detection, signal cabinets, and communications equipment. Additional coordination was required with the Road Commission for Oakland County (RCOC), as they maintain the traffic signals for MDOT.

CLINTON COUNTY ROAD COMMISSION, MICHIGAN

CAPITAL AREA INTERNATIONAL AIRPORT

This operations and safety study includes modeling and analysis for 14 intersections around the Capital City (Lansing) Airport, including signalized intersections, a roundabout, two I-69 interchanges, and traffic signal warrant evaluations for several stop-controlled intersections. The study area surrounding the airport was modeled in Synchro to evaluate current and future

KYLE REIDSMA, PE, PTOE

VICE PRESIDENT | SENIOR TRAFFIC ENGINEER | PROJECT MANAGER

intersection operations. Recommendations for corridor and intersection improvements are being developed to facilitate funding decisions by the Road Commission for upcoming rehabilitation projects. The Airport Authority is also utilizing study findings to coordinate investment in land development opportunities.

CITY OF GRAND RAPIDS, MICHIGAN

SIGNAL OPTIMIZATION - PHASE XVII

Fishbeck is currently working as a subconsultant on the City's traffic signal optimization project at 65 intersections across four corridors. Fishbeck is analyzing the 68th Street (12 intersections), Burton Street (14 intersections), and Alpine Avenue (22 intersections) corridors. The project includes data collection, modeling existing conditions in Synchro/SimTraffic software, optimization of signal timings for a.m./mid-day/p.m. peak hours, implementation of the proposed timings along with a field review, and a report documenting the methodologies, findings, and recommendations of the signal optimization project. The project involves coordination with the City, Kent County Road Commission, and MDOT as they are all stakeholders and owners of intersections/roadways that fall within these corridors.

GENESEE COUNTY METROPOLITAN PLANNING COMMISSION (GCMPC) | GENESEE COUNTY, MICHIGAN

ROUNDABOUT FEASIBILITY STUDY

Fishbeck was a subconsultant for the county-wide study of 3,600 federal-aid eligible intersections. Using an MDOT grant, the study evaluated the feasibility for roundabout implementation as a means of improving safety and traffic operations throughout the county. A skim analysis was completed of all 3,600 intersections reviewing crashes that resulted in fatality or severe injury and were a result of an angle or head-on-left turn crash. A secondary analysis was completed to further narrow down the list of potential intersections well suited for a roundabout resulting in 14 intersections selected for early preliminary engineering analysis. Technical analysis including microsimulation, as well as assessment of the ROW and surrounding features was performed to identify the most highly suitable intersections to be considered for future project planning.

US-23 CORRIDOR TRAFFIC STUDY

Fishbeck is a subconsultant for this ongoing project studying the US-23 corridor between Owen Road and Bristol Road. The study includes analysis of several interchange alternatives, including one mile in each direction from US-23 along the following corridors: Hill Road, Grand Blanc Road, Thompson Road, North Road, Torrey Road, Silver Lake Road, and Owen Road. The goals of the study are to identify both short and long term options to improve the operational efficiency, reliability, and safety for all users of the US-23 corridor.

BAY MILLS INDIAN COMMUNITY | BAY MILLS TOWNSHIP, MICHIGAN

WAISHKEY BRIDGE RSA

Fishbeck is leading this RSA for the Bay Mills Indian Community (BMIC) at the norther terminus of M-221 and includes the bridge over the Waishkey River and the adjacent intersection of M-221/Lakeshore Drive/6 Mile Road. The various users of these facilities and accommodations for all modes of travel (passenger vehicles, trucks, off-road vehicles, snowmobiles, bicycles, and pedestrians) are of particular interest. Fishbeck worked with stakeholders such as MDOT, Chippewa County Road Commission and BMIC. This RSA will include seasonal reviews to determine the safety impacts on the different modes of travel in the winter and summer, as this area is part of a snowmobile route.

GUN LAKE TRIBE | WAYLAND TOWNSHIP, MICHIGAN

M-179 ROAD SAFETY AUDIT

Fishbeck completed this RSA for Gun Lake Tribe to facilitate planning efforts for improvement to M-179 following the reconstruction of US-131/M-179 interchange and in advance of anticipated land development. The RSA team identified several safety concerns associated with pedestrian safety and turning movements in and out of the casino and Tribal government campus driveways. Improvements to pedestrian safety were suggested via sidewalk parallel with M-179 and controlled crossing of M-179 between the casino and gas/convenience store. Driveway safety

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improvements were suggested to improve sight distance for site egress and to add a left turn lane on M-179 for ingress to the Tribal government campus. Fishbeck facilitated meetings between Gun Lake Tribe and MDOT to develop suggestions that are expected to be impactful and that can be reasonably implemented.

BAD BIRD WAY INTERSECTION AND ROADWAY IMPROVEMENTS

Design for a new roadway, Bad Bird Way, which intersects M-179 at the location of the new entrance to the Gun Lake Casino. The design included reconfiguring access to the gas station on the south side of M-179 and extending the roadway and utilities to the south for future expansion. A traffic signal warrant analysis was completed in coordination with MDOT to demonstrate that the new intersection should be signalized. Fishbeck also designed the new traffic signal along M-179 to MDOT standards, providing signalized access for vehicles and pedestrians at this new intersection.

INGHAM COUNTY ROAD DEPARTMENT, MICHIGAN

OKEMOS ROAD BRIDGE OVER RED CEDAR RIVER

Design for replacement of existing Okemos Road bridges over the Red Cedar River and associated road work. A single bridge was designed to replace the existing two bridges. Project is located between two parks and adjacent to an existing truss bridge, making aesthetics very important. Replacement bridge was constructed by part-width staged construction. The project also included camelback bridge barrier railings, sidewalk, retaining walls, traffic signals, permitting, and MS4 underground stormwater management system. Project involved extensive coordination with Meridian Township, Ingham County Drain Commissioner, Village of Okemos redevelopment project, and utility owners.

OKEMOS ROAD CORRIDOR OPTIMIZATION

Fishbeck analyzed and provided optimized operational recommendations for Okemos Road for the Ingham County Road Commission. Study scope included 10 signalized intersections from the I-96 interchange through M-43 (Grand River Avenue). The County is undergoing several related projects including new bridge crossing of the Red Cedar River and signal equipment upgrades along the corridor. Study recommendations are being referenced by the County to allocate funding to improvements that were demonstrated to provide benefit for traffic operations and safety.

CITY OF DETROIT, MICHIGAN

DETROIT PROGRAM MANAGEMENT: DEXTER AVENUE STREETSCAPE

QC Reviewer of the Dexter Avenue Streetscape project that is a part of a 5-year program to administer a $200 million bond program for complete street design throughout the City. Kyle performed traffic engineering analysis of three intersections along the corridor from Webb Street northwest to Dawson Street (0.8 miles) which included obtaining traffic data, field reviews of each intersection, and development of Synchro models of the existing and propoed alternatives. A detailed report for assessment of site impacts on adjacent roadways with findings, recommendations, and supporting documentation was prepared and included parking and pedestrian evaluation. The current preferred alternative consists of a road diet from 5 to 3 lanes with a 12-foot-wide, 2-way protected bicycle path and on-street parking.

HAMTRAMCK ROAD TRAFFIC STUDY AND DESIGN

QC reviewer for a traffic study for six signalized intersections adjacent to the General Motors (GM) Factory Zero plant in Hamtramck. The traffic analysis was used to evaluate potential improvements and changes to capacity based on modifications to roadway configurations related to proposed improvements and inclusion of bike lanes. A road diet analysis of Hamtramck Drive was included to determine if bike lanes could be added to the roadway as part of a connection of the Joseph Campau Greenway non-motorized path.

GREAT LAKES WATER AUTHORITY

23 MILE ROAD/DEQUINDRE ROAD/AVON ROAD ROUNDABOUT DESIGN

Traffic engineer for design services associated with construction of a new 96-inch water main. The project entailed road reconstruction as well as roundabout design. Road improvements were

KYLE REIDSMA, PE, PTOE

VICE PRESIDENT | SENIOR TRAFFIC ENGINEER | PROJECT MANAGER

designed to meet requirements of the Road Commission for Oakland County, Macomb County Department of Roads, and City of Rochester Hills. Fishbeck services included traffic analysis, roundabout, drainage, MOT, and signal design, EGLE permit applications, utility coordination, and preparing contract documents to meet RCOC requirements.

96-INCH WATERMAIN REPLACEMENT | ROCHESTER HILLS, MICHIGAN

Lead traffic signal engineer for the design of two high intensity activated crosswalk (HAWK) pedestrian treatments at a midblock crossing for the Yates Cider Mill and on the north leg of the proposed roundabout at the 23 Mile Road/Dequindre Road intersection. In addition, the project includes the design of a roundabout, road reconstruction, watermain, non-motorized pathway, signing and pavement markings. The existing traffic signal at 23 Mile Road/Dequindre Road was designed for removal with the installation of the roundabout. The project involved significant coordination with the client, utility companies, local municipalities, RCOC, and the design of a road construction immediately adjacent to this project limits.

CITY OF NOVI, MICHIGAN

VARIOUS PROJECTS

Lead traffic signal engineer for various traffic signal designs as part of roadway design projects for the City of Novi. Designs varied in scope depending on the larger road design project but included temporary signal modifications, warning sign flashers, new traffic signal installations, and rapid rectangular flashing beacons (RRFBs). More recent projects include signal modifications at Novi Road/Flint Street, pushbutton upgrades and sidewalk ramps at 10 Mile Road/Taft Avenue, a new traffic signal at Grand River Avenue/Crescent Boulevard, and RRFBs at three midblock locations associated with the ITC non-motorized trail.

MACOMB COUNTY DEPARTMENT OF ROADS, MICHIGAN

25 MILE ROAD/ROMEO PLANK ROAD TRAFFIC STUDY AND ROUNDABOUT DESIGN

Traffic engineer. Fishbeck performed a traffic study and roundabout design at this congested intersection. The traffic study task included coordination with SEMCOG regarding their regional travel model and traffic shifts associated with construction of a new segment of Garfield Road. The traffic analysis included capacity and sensitivity analysis (using Rodel software) for several different traffic volume scenarios. Using this information, Fishbeck prepared a base plan geometric design for a two-lane roundabout.

ROAD COMMISSION FOR OAKLAND COUNTY | TROY, MICHIGAN

SOUTH BOULEVARD AT LIVERNOIS ROAD

Lead traffic signal engineer for the design of a traffic signal modernization related to the widening of South Boulevard. The road design project included the addition of turn lanes and sidewalk ramp upgrades at the intersection. The traffic signal design included staging plans to facilitate the road construction. The modernization included a new controller and cabinet, new box-span configuration, wireless vehicle detection, pedestrian pushbuttons and new signal heads to accommodate operational improvements such as left-turn phasing and right-turn overlaps.

CITY OF YPSILANTI, MICHIGAN

DEPOT TOWN PARKING STRUCTURE FEASIBILITY STUDY

Studied the feasibility of a parking structure at two city-owned sites. The project scope included Phase I environmental assessment, boundary and topographical survey, geotechnical borings and preliminary recommendations, parking structure layouts, cost estimates, review of funding options, massing renderings, a traffic study, and a formal presentation of results.

MEIJER | VARIOUS LOCATIONS, MICHIGAN

TRAFFIC IMPACT STUDIES

Performed traffic impact studies for various Meijer development opportunities. Work involved traffic data collection and Synchro models for existing, future, and build out conditions for morning and afternoon peak hours. The TIS included trip generation, traffic distribution, capacity analysis, and development of geometric and signal timing recommendations related to the site development.

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VICE PRESIDENT | SENIOR TRAFFIC ENGINEER | PROJECT MANAGER

MEIJER | CALEDONIA, MICHIGAN

MEIJER GAS STATION TRAFFIC IMPACT STUDY

Fishbeck performed a traffic impact study for the development of a new Meijer gas station and outlots in the northeast quadrant of the M-37/68th Street intersection in the Caledonia Township, Kent County, Michigan. The traffic impact study included collecting turning movement data, modeling the study area in Synchro, generating and assigning trips to the network, and proposing mitigation measures associated with the development. Coordination with MDOT, Kent County Road Commission, and the Caledonia Township occurred throughout the TIS. A signal warrant study was conducted and found that a traffic signal would be warranted at the new driveway along M-37. Fishbeck designed the driveway to MDOT standards in coordination with the adjacent traffic signals along M-37, at 68th Street and the indirect left-turn crossovers. The new signal utilized a box-span configuration. Pedestrian signal and actuation improvements were also designed at the M-37/68th Street intersection.

WINDSOR-DETROIT BRIDGE AUTHORITY | DETROIT, MICHIGAN

GORDIE HOWE INTERNATIONAL BRIDGE CROSSING

Discipline lead for traffic engineering for the construction of the Michigan interchange for a new international bridge between Detroit and Windsor, Ontario. This portion of the design-build project included the construction work along I-75 and various local roads for the connection to the new point of entry into the U.S. The discipline lead oversaw the traffic engineering work including MOT, permanent signing and pavement markings, temporary and permanent traffic signals, and ITS devices in the Michigan interchange project portion.

MDOT | REGION LOCATION???????

M-17 REHABILITATION AND SIGNAL MODERNIZATION

Fishbeck is providing design services to MDOT for this signalized corridor running from the I-94 interchange through the City of Ypsilanti. Fishbeck duties included preparing a mobility analysis for the construction staging including Synchro models for to optimize corridor travel times. We also prepared signal modernization plans at two intersections and new pedestrian signals (including pushbuttons) at three intersections. Fishbeck analyzed conditions during construction to optimize throughput and minimize the impacts of lane closures. Additionally, analyzed and provided MDOT with traffic signal timing recommendations for modified intersection configurations and signal operations to be programmed for post-construction operations.

US-10BR/M-20 RECONSTRUCTION

Fishbeck is providing design services to MDOT for this signalized corridor running through the City of Midland. Fishbeck duties included preparing a mobility analysis for the construction staging including Synchro models for to optimize corridor travel times. We analyzed various alternatives for construction staging, including Synchro analysis of detour route operations and identification of critical capacity constraints on the project and detour routes. Signal optimization and capacity analyses are being referenced to plan lane closures during construction, detour routes, and future traffic signal operations on the corridor.

I-96 AND M-21/M-37/M-44 NETWORK EVALUATION

The I-96/M-21 interchange in Grand Rapids is being reconstructed to add a new on-ramp to I-96 EB at the partial interchange to improve access connections. As part of the project, Fishbeck provided design services and operational analyses for the interchange and surrounding area. Synchro traffic modeling software was used to evaluate mobility during construction to make recommendations for traffic control. Additionally, Fishbeck completed capacity analyses for the interchange and surrounding surface roadway network to support the Interchange Access Change Request (IACR). This included data collection and Synchro modeling to evaluate signal operations, vehicle delays, and queueing at intersections along M-37 between Cascade Road and the I-96 interchange.

MDOT | GRAND REGION

AS-NEEDED TRAFFIC AND SAFETY SERVICES

QC Reviewer for operations and safety analysis of the I-96/M-21 interchange in Grand Rapids

KYLE REIDSMA, PE, PTOE

VICE PRESIDENT | SENIOR TRAFFIC ENGINEER | PROJECT MANAGER

to evaluate the addition of two new ramps to create a full access interchange. Operations were evaluated using Highway Capacity Software and Synchro/SimTraffic and reports were prepared to outline findings/recommendations to MDOT and FHWA. Historical crash data and predicitve crash analyses were performed including design exception investigation for shoulder width on the new M-21 merge to EB. This work was utilized to obtain an Interstate Access Change Request (IACR) by FHWA in coordination with MDOT. Study evaluations also included operations and safety for the surrounding surface network along M-21 and M-36/M-44. Fishbeck also prepared construction estimates, design plans, MOT concepts/plans, and mobility analysis during construction.

MDOT | STATEWIDE

ROAD SAFETY AUDITS AS-NEEDED

As part of MDOT's As-Needed Road Safety Audits contract, Fishbeck has led and facilitated two RSA's. Fishbeck was responsible for guiding the MDOT/stakeholders through the RSA process, leading a team of multidisciplined professionals during the audit, identifying potential safety concerns, developing mitigation measures, and drafting the RSA report. Benefit/cost analysis using guidance provided in the Highway Safety Manual (HSM) was presented with a Time-of-Return analysis in the final RSA report to facilitate project design decisions and potentially project funding.

- M-22/M-72 in Traverse City – Located along the west arm of the Grand Traverse Bay, seasonal congestion, pedestrian safety including mid-block HAWK signalized crossings, and operational issues at the M-22/M-72/Bay Street intersection were a large focus of this RSA.
- M-89 from M-222 to 29th Street in the City of Allegan – The study area includes the convergence and divergence of three MDOT trunkline routes (M-89/M-40/M-222); whereby unique turning movement patterns, unsignalized left-turns, and pedestrian crossings complicate both operations and safety. Additionally, the RSA team provided specific recommendations for the M-89 intersection with M-40/Ely/Hubbard Street, which the City and MDOT plan to reconstruct as a roundabout.
- I-196 SB and I-94 EB in Benton Township - This RSA was completed in response to increased crash occurrences following the reconstruction of the loop ramp. The reconstruction of the ramp curve resulted in frequent roadway departures and overturn crashes.

MDOT | GRAND LEDGE, MICHIGAN

TRAFFIC SIGNAL MODERNIZATION

The project involved the modernization of the traffic signal equipment at the M-43 (Saginaw Highway) / Nixon Road intersection. Upgrades included all new traffic signal in a box-span configuration with far-side traffic signal heads, installation of sidewalk and pedestrian signals, operational improvements for permissive/protected left-turn phasing, and vehicle detection. Vehicular detection was designed as video detection with the installation of an advanced dilemma zone video detection system on M-43 due to crash history. In addition, warning signs and flashing beacons approaching the intersection in each direction on M-43 were upgraded. The project included utility coordination and coordination with the MDOT TSC related to maintenance of traffic for construction.

MDOT | DEARBORN, MICHIGAN

US-24 REHABILITATION

Fishbeck designed the rehabilitation for 1.7 miles of US-24 including cold milling, HMA overlay, intersection approaches, sidewalk ramp upgrades, signing, pavement markings and traffic signal modernizations. Traffic signal staging and modernization plans were designed for seven intersections. The traffic signals included full modernization to box-span configurations with new support structures. New signal controllers and cabinets, pedestrian countdown heads, case signs, span wires, and all other infrastructure was designed for improvement. Close coordination with the utility companies and sidewalk ramp designs were important due to limited right-of-way. A signal warrant analysis was performed at the New York Street intersection and the analysis indicated that the signal should remain.

KYLE REIDSMA, PE, PTOE

VICE PRESIDENT | SENIOR TRAFFIC ENGINEER | PROJECT MANAGER

MDOT | KALAMAZOO, MICHIGAN
I-94BL TRAFFIC SIGNAL MODERNIZATION AND ADAPTIVE SIGNAL SYSTEM

Design of an adaptive traffic signal system along the I-94 BL (Stadium Drive) corridor from 11th Street to South Street. The project included modernizing five intersections, crash analysis, signal timing optimizations, and installation of CCTV cameras. The MDOT project also worked in conjunction with the City of Kalamazoo to utilize a number of their design standards. The 11 signalized intersections were interconnected via a fiber interconnect system to improve operations along the corridor.

MDOT | TRAVERSE CITY, MICHIGAN
US-31, M-72 ADAPTIVE TRAFFIC SIGNAL CONTROL SYSTEM

Lead traffic signal designer for traffic signal and ITS design services at 21 traffic signal locations. Traffic signal work included full modernizations at 14 locations and various upgrades (controllers, radios, advanced detection) at the remaining seven locations. In addition to the traffic signal work, the project included the solicitation and selection of a vendor for the adaptive signal control technology (ASCT) component to be implemented in the final design and the development of ITS technologies (Wi-fi readers, environmental sensor station site, CCTV cameras, and dynamic blank out signs) throughout the corridors.

MDOT | DETROIT, MICHIGAN
M-5 STREETSCAPE

Traffic signal designer providing design assistance during construction and shop drawing review for the rehabilitation of M-5 (Grand River) from M-39 to Berg, which includes extensive streetscape for two distinct neighborhood segments and water main replacement. Proposed streetscape improvements include one- or two-way bike lanes, sidewalk bump-outs, benches and other appurtenances, lighting, and trees. Fishbeck coordinated with the City of Detroit Planning and Development Department and MDOT to deliver the project under an aggressive schedule.

MDOT | DETROIT, MICHIGAN
I-94 ADVANCED BRIDGES

Lead traffic signal designer for the reconstruction of eight bridges within the limits of the I-94 modernization project, between I-96 and Conner Avenue. The project included traffic signal warrant analysis, temporary signal staging plans during construction, and final box-span configurations. The project included coordination with various consultants for road, bridge, lighting, MOT, and ITS design as well as with the City of Detroit.

MDOT | DETROIT, MICHIGAN
TRAFFIC SIGNAL MODERNIZATIONS

As a sub to OHM, Fishbeck designed the modernization of the two I-96 WB off-ramps at Evergreen Road in Detroit and the four intersections in the 'double boulevard' at M-102 and Harper Avenue in Harper Woods. The design included a combination of box-spans with span wires and mast arm supports. One intersection needed to be modified to mast arm supports very late in design in order to not incur large construction delays/costs associated with overhead utility conflicts. A pedestrian crosswalk, with pushbuttons, was added to the SB Evergreen intersection to improve pedestrian connectivity at the intersection and to provide a safe crossing of Evergreen Road. The signal modernizations included upgrades to all equipment at the intersection, and the addition of wireless vehicular detection at the I-96 WB off-ramp intersections. In addition, Fishbeck also performed an independent review of OHM's design plans at six additional intersections that were included in the project.

MDOT | THREE RIVERS, MICHIGAN
US-131 RECONSTRUCTION

Lead traffic signal designer for traffic signal upgrades as part of the reconstruction of US-131 to a median-divided roadway. Traffic signal design included temporary signal plans for the multi-season construction staging at seven intersections. A temporary signal for construction was also included in the design. Radio interconnect was designed for communications between the signals.

KYLE REIDSMA, PE, PTOE

VICE PRESIDENT | SENIOR TRAFFIC ENGINEER | PROJECT MANAGER

MDOT | SAULT STE MARIE, MICHIGAN
I-75 BL RECONSTRUCTION

Lead traffic signal designer for traffic signal improvements as part of the reconstruction of I-75 BL and installation of a roundabout. The project included signal staging plans for six intersections, modernization of two intersections, and upgrades at the other four locations including wireless communications. A temporary signal for 1-lane, bi-directional traffic was also designed for approach work for the I-75 BL bridge over I-75.

MDOT | JACKSON, MICHIGAN
I-94 BL RECONSTRUCTION

Lead traffic signal engineer for the design of the reconstruction of I-94 BL, an existing narrow 4-lane roadway, and the conversion of a one-way pair (Louis Glick and Washington Avenue) to two-way roadways. The project included signal improvements at 14 intersections as well as complex signal operations and railroad coordination at the Louis Glick/Cooper intersection.

MDOT | THREE OAKS, MICHIGAN
US-12 OVER DEER CREEK

Lead traffic signal designer for temporary traffic signals to support the reconstruction of the MDOT-designed US-12 structure over Deer Creek. The traffic signals were required to facilitate part-width construction while maintaining 1-lane of bi-directional traffic with various driveways within the project limits. The signals operated as fully actuated using wireless vehicle detection.

MDOT | MACOMB COUNTY, MICHIGAN
SIGNAL MODERNIZATION

Lead traffic signal engineer for the design of the modernization of 16 traffic signals located throughout Macomb County. The project included a variety of different intersections, both rural and urban, being modernized to box-span configurations with new traffic signal equipment including ADA-compliant sidewalk ramps. The project involved utility coordination as well as engineering assistance to MDOT during construction.

MDOT NORTH REGION, MICHIGAN
I-75 FROM GRAYLING TO MACKINAW CITY

Lead traffic signal engineer for the design of ITS improvements along the I-75 corridor in northern Michigan including the design of CCTV cameras, DMS devices, warning signs, and traffic signal improvements on M-32 in Gaylord. The signal design included modernizing two intersections, radio interconnect of seven intersections, and the addition of system detection to create a traffic responsive signal system along M-32.

MDOT | SALINE, MICHIGAN
US-12 FROM SALINE RIVER TO MAPLE ROAD

Lead traffic signal engineer for the reconstruction of US-12 through Saline including staging plans, temporary detour route signals, coordination with a comprehensive streetscape plan, fire-station pre-emption at one intersection, and modernization of four signalized intersections.

MDOT | OAKLAND COUNTY, MICHIGAN
M-1 AND US-24 SIGNAL MODERNIZATION

Lead traffic signal engineer for the design of the signal modernizations at five intersections along M-1 and US-24. Design services also included upgrades to sidewalks and accommodations for City-owned features such as landscaping and CCTV cameras.

MDOT | AUBURN HILLS, MICHIGAN
UNIVERSITY DRIVE OVER I-75 DDI

Lead traffic signal engineer responsible for the development of design-build procurement documents for replacement of the University Drive bridge over I-75 and reconfiguration of the interchange as the state's first Diverging Diamond Interchange (DDI), including authoring sections of the contract documents and review of traffic signal design for MDOT.

MDOT | GRAND RAPIDS, MICHIGAN

KYLE REIDSMA, PE, PTOE

VICE PRESIDENT | SENIOR TRAFFIC ENGINEER | PROJECT MANAGER

I-96 AT CASCADE ROAD INTERCHANGE STUDY

Traffic engineer responsible for providing traffic modeling QA/QC for the interchange feasibility study for the replacement of the Cascade Road bridge over I-96, including analysis and comparison of numerous alternatives, capacity analysis, crash analysis, traffic simulation, and cost estimating. The preferred alternative was a complex two-bridge DDI that improved traffic flow and safety.

MDOT | PORT HURON, MICHIGAN

BLUE WATER BRIDGE MASTER PLAN

Traffic engineer responsible for VISSIM modeling for a queueing analysis for both the US and Canadian sides of the Blue Water Bridge, including tollbooths and border inspection booths. Existing and future models were created to develop queueing characteristics and analyze different alternatives for the points of entry into both countries.

MDOT | MACOMB COUNTY, MICHIGAN

SIGNAL MODERNIZATION (2/10 - 2/12)

Lead traffic signal engineer for the design of the modernization of 16 traffic signals along M-59, M97, and other routes in Macomb County. The design included new span wire, strain poles, vehicle detection, pedestrian countdown timers, and ADA-compliant sidewalk upgrades. The designs also complied with the ITS equipment requirements of the Macomb County Department of Roads.

MDOT | WAYNE COUNTY, MICHIGAN

M-39 FROM I-94 TO M-10

Lead traffic signal engineer for the design for the rehabilitation of 2.5 miles of M-39 from McNichols Road to M-10, including rehabilitation of 16 bridges over M-39, replacement of 5 miles of screen wall, incorporation of bridge, lighting, and signing plans completed by others, drainage improvements, permanent signing and pavement markings, MOT plans, ITS improvements, modernization of 30 traffic signals, and coordination to incorporate design plans developed by MDOT and other consultants.

MDOT | DETROIT, MICHIGAN

M-1 RAIL Q-LINE STREETCAR PROJECT

The M-1 Rail project was scoped to build a modern rail system linking Downtown Detroit and the New Center area along Woodward Avenue. As the lead traffic signal engineer, I oversaw the design of the traffic signals at 23 intersections, along with coordination with a variety of disciplines including systems engineering for fiber interconnect, overhead contact system (OCS), MOT design, utility engineering, roadway design, structural design, and architectural design.

MDOT | OXFORD, MICHIGAN

M-24 RECONSTRUCTION

Lead traffic signal engineer for the design project for the reconstruction of M-24 through the Village of Oxford. Within the project limits were four traffic signals along M-24 at Drahner Road, Broadway Street, Burdick Street, and Church Street that were modernized. In addition, signal staging plans along M-24 were designed to accommodate the construction staging. The construction staging utilized a directional detour which required signal modifications at the intersection of Burdick Street and Glaspie Street and a temporary traffic signal installed at Ray Road and Oxford Road. Limited right-of-way, utilities, and streetscape elements required careful coordination for the location of signal equipment at the Burdick Street intersection.

MDOT | OAKLAND COUNTY, MICHIGAN

M-59 RECONSTRUCTION

Lead traffic signal engineer for the design project for the reconstruction of M-59 from the Oakland County line to Milford Road in Oakland County. Within the project limits were three existing traffic signals along M-59 at Hickory Ridge Road, the X-over west of Milford Road, and Milford Road. The Hickory Ridge Road and X-over signals were modernized prior to this project and only required upgrades to detection and pushbuttons/pedestrian signals. The Milford Road intersection was

modernized to a box-span configuration with all new traffic signal equipment. In addition, new traffic signals were installed at the X-over intersections on both sides of Hickory Ridge Road to help facilitate increasing left-turn volumes.

KENT COUNTY ROAD COMMISSION | KENT COUNTY, MICHIGAN

TRAFFIC SIGNAL DESIGN

Lead traffic signal engineer for the design of over 30 signalized intersections throughout Kent County including modernizing to box-span configurations, upgrading detection and pedestrian signals, ADA-compliant sidewalks and pushbutton locations, wireless radio interconnect, and coordination with utility companies and road construction projects.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION | FORSYTH COUNTY, NORTH CAROLINA

WESTERN SECTION OF US-52 INTERCHANGE – REVISED DESIGN MICROSCOPIC TRAFFIC SIMULATION STUDY

Traffic engineer responsible for the VISSIM modeling required for the simulation study requested by the FHWA. The US-52 (future I-74) corridor in the vicinity of the Winston-Salem Northern Beltway was simulated to determine its operational adequacy. The goal of the study was to fulfill the request of the FHWA to determine and assess the need for any additional improvements along the corridor. The study analyzed three potential scenarios for the study area that combine both the proposed project as well as future improvements under a separate project to widen US-52.

MICHIGAN STATE UNIVERSITY | EAST LANSING AND GRAND RAPIDS, MICHIGAN

BOGUE/WILSON TRAFFIC SIGNAL IMPROVEMENTS

Lead traffic signal engineer for the design of traffic signal improvements at the Bogue/Wilson intersection due to the removal of the northern leg of the intersection. The intersection was modified with the construction of the Facility for Rare Isotope Beams and traffic signal modifications were required. Coordination with MSU and Lansing Board of Water & Light resulted in construction completing within six weeks of submitting preliminary plans.

BOGUE/SHAW STREET INTERSECTION RECONSTRUCTION

Lead traffic engineer for the design and reconstruction of Bogue/Shaw intersection on Michigan State University's campus, including removal of the existing traffic circle, landscaping, transit enhancements, re-alignment of the Bogue and Shaw Streets to minimize impacts to existing trees and shrubs, installation of bicycle lanes along both roadways and upgrade of all intersection treatments and pedestrian ways for ADA, water main and sanitary replacement, upgrade of storm sewer system, permanent signing and pavement markings, traffic signal design, and maintenance of traffic plans.

INNOVATION PARK DEVELOPMENT TRAFFIC IMPACT STUDY (TIS)

Traffic impact study for development of MSU's new 7-level medical building, 600-space parking deck, and office building along Michigan Street in downtown Grand Rapids, including Synchro models with six signalized intersections for existing, future, and build out conditions for morning and afternoon peak hours. The TIS included trip generation, traffic distribution, capacity analysis, and development of recommendations related to the site development.

CITY OF PORT HURON, MICHIGAN

TRAFFIC SIGNAL SYSTEM DESIGN AND OPERATIONS

Traffic signal design engineer for the planning, design and optimization of a wireless traffic signal interconnect system using a licensed frequency. The communications system provides a link between 20 traffic signals, three bascule bridges, a fire station and the City's Municipal Office Center. Two-way notification between the bridge houses and fire station will allow for improved emergency vehicle access. The traffic signal timings adjust during a bascule bridge event to accommodate the shift in traffic from one bridge to another.

UNIVERSITY OF MICHIGAN | ANN ARBOR, MICHIGAN

MEDICAL CENTER TRAFFIC STUDY

KYLE REIDSMA, PE, PTOE

VICE PRESIDENT | SENIOR TRAFFIC ENGINEER | PROJECT MANAGER

Traffic engineer responsible for developing a Synchro model of the University of Michigan's Medical Campus to analyze the existing conditions as well as future conditions. The model takes into account construction projects and geometric roadway improvements. In addition to field visits, results were analyzed in order to make recommendations to the University.

STADIUM EXPANSION PROJECT

Traffic engineer for the $226-million renovation and expansion of the University of Michigan's football stadium. The project includes maintaining vehicular and pedestrian traffic during different stages of construction, pavement markings, traffic signal modifications, and construction vehicle routing. Synchro software was used to model traffic around the Stadium to determine impacts of the detour routes on surrounding neighborhoods. A pedestrian study was also performed during football game days to determine additional safety measures necessary for pedestrians entering and exiting the Stadium.

C.S. MOTT CHILDREN'S AND WOMEN'S HOSPITAL CONSTRUCTION

Traffic engineer for the $754-million reconstruction of the University of Michigan's Children's and Women's hospital. The project includes maintaining vehicular and pedestrian traffic during numerous stages of construction, a mast arm traffic signal design including radio interconnect, converting a one-way street to two-way traffic during construction, and designing the final layout of signing and pavement markings adjacent to the hospital.

OTTAWA COUNTY ROAD COMMISSION | OTTAWA COUNTY, MICHIGAN

68TH AVENUE/RANDALL STREET ROUNDABOUT

Traffic engineer responsible for developing the pavement marking and permanent signing plans for the construction of a new modern roundabout at the 68th Avenue/Randall Street intersection in Coopersville. VISSIM was also used to show the proposed roundabout layout and operations. VISSIM animations were used for the client and public presentation of the roundabout.

CITY OF WYOMING, MICHIGAN

TRAFFIC ENGINEERING SERVICES

Traffic engineer responsible for providing various traffic engineering services to the City of Wyoming including speed studies, intersection crash and improvement evaluations, and traffic signal flash schedule reviews. The intersection evaluations included crash diagrams, crash rates, capacity analysis, and potential mitigating measures.

CITY OF MUSKEGON, MICHIGAN

TRAFFIC SIGNAL WARRANT STUDY

Lead traffic engineer responsible for evaluating the MMUTCD's traffic signal warrants at 13 intersections for the City of Muskegon to determine if any of the existing signals could be removed. This included overseeing the data collection efforts required to analyze the signal warrants and presenting the results to the City of Muskegon in a report as well as by providing insight at a City Commission meeting.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION | IRDELL COUNTY, NORTH CAROLINA

I-40/I-77 INTERCHANGE MODIFICATION TRAFFIC CAPACITY ANALYSIS

Traffic engineer responsible for the quality assurance review of the VISSIM models, outputs, and traffic capacity analysis. The capacity analysis was for the NCDOT's proposed project to reconfigure the full cloverleaf interchange between I-40 and I-77. The study area encompassed the I-40/I-77 interchange and four adjacent interchanges. The VISSIM model was used for modeling future conditions and to assess what additional future improvements should be implemented in order to achieve acceptable levels-of-service in the design year.

INDOT | SEYMOUR DISTRICT

TRAFFIC SIGNAL MODERNIZATION PROJECT – DES. NO. 2000220

This project included the modernization of traffic signal equipment at seven intersections and was designed under a condensed timeline, with an authorization in March 2020 and final tracings completed in December 2020. The project included survey, utility coordination, pavement

KYLE REIDSMA, PE, PTOE

VICE PRESIDENT | SENIOR TRAFFIC ENGINEER | PROJECT MANAGER

marking design, and traffic signal design at seven intersections throughout the INDOT Seymour District. The modernization work included upgrading traffic signal heads, backplates, span/tether/catenary lines, conduit, cabling, overhead signing, cabinets, detector housings, and loop detectors. Pavement markings, within the limits of advanced loop detection, were designed to be refreshed. In addition, an Abbreviated Engineer's Report was also developed for the project.

SR 37 AT DILLMAN INTERSECTION IMPROVEMENT PROJECT – DES. NO. 1800371

Kyle was the lead designer for developing the Engineering Assessment Report. This report development required an in-depth Traffic Engineering Study to evaluate different alternatives to improve the safety of the intersection, reduce crash frequency and severity of collisions while reducing traffic delays and enhancing mobility. Kyle analyzed six alternatives based on INDOT's Intersection Design Guide and INDOT's Intersection Traffic Analysis Procedures documents. Kyle will also assist INDOT by presenting the traffic study for a Public Outreach event. INDOT Seymour District PM is Brad Williamson.

US 50 HMA OVERLAY AND SIGNAL DESIGN PROJECT – DES. NO. 2000369

Kyle is leading the project for Fishbeck which involves HMA Overlay, sidewalk ramp improvements and signals modernization. The project includes the replacement of signal loop detectors and APS pushbuttons for ADA-compliance at nine intersections of US 50 in downtown Seymour. INDOT Seymour District PM is Karlei Metcalf.

INDOT | GREENFIELD DISTRICT

SR 9 AND CR 600 N INTERSECTION IMPROVEMENT PROJECT – DES. NO. 1900152

This intersection is currently signalized and there were elevated number of crashes and high speed rear end crashes. The intent is to replace the traffic signal and construct a reduced conflict intersection while allowing left turns on SR 9. Kyle is leading Fishbeck's traffic efforts for the project includes signing, signals pavement markings, traffic analysis for turn lane lengths, queueing analysis to support MOT for phased construction. INDOT Greenfield District PM is Donald McGhghy.

ROUNDABOUT ANALYSIS

VIRGINIA DEPARTMENT OF TRANSPORTATION | ROANOKE, VIRGINIA

I-81 AT US-220/US-11 INTERCHANGE MODIFICATION REPORT

Traffic engineer for developing an interchange study at the subject interchange due to increased traffic volumes and development in the area. Synchro, SIDRA, and VISSIM were all used as part of the analysis to model the alternatives including a roundabout, two signalized intersections, and several commercial driveways.

KENT STATE UNIVERSITY | KENT, OHIO

SUMMIT/CAMPUS CENTER INTERSECTION ANALYSIS

Intersection analysis project using SIDRA and VISSIM software to analyze a proposed roundabout at the Summit Street/Campus Center Drive intersection. Due to the high pedestrian volumes on the Kent State University campus, an alternative with pedestrian hybrid (HAWK) signals was included in the analysis.

CITY OF KENTWOOD, MICHIGAN

BRETON/WALMA ROUNDABOUT

Traffic engineer for an engineering study and subsequent design of a single-lane modern roundabout. The project included design of intermittent mid-block crossings and bike lanes with connections to a non-motorized path. Roundabout analysis was performed using RODEL software.

MDOT | HOLLAND, MICHIGAN

M-40 SCOPING STUDY

Traffic engineer for the scoping analysis of multiple improvements along M-40 in the vicinity of the I-196 interchange including roundabout concepts using RODEL software.

FIRSTNAME LASTNAME, REGISTRATIONS

(TITLE) PRINCIPAL/SENIOR VICE PRESIDENT

MDOT | CASS COUNTY, MICHIGAN

US-12/OLD M-205 SCOPING STUDY

For the purposes of safety improvements due to multiple fatal crashes, a scoping study looking at three alternatives was developed for the intersection of US-12 with Old M-205 and Five Points Road. Responsibilities on this project included review of RODEL analysis, laneage recommendations for the five-leg roundabout alternative, and traffic control design plans.

CITY OF TRAVERSE CITY, MICHIGAN

DIVISION STREET CORRIDOR IMPROVEMENTS

Developed six alternatives for the Division Street corridor to determine the impact of traffic flow. The various alternatives looked at roundabouts at various intersections from 14th Street to Grandview Parkway using HCM for determining laneage and VISSIM software for microsimulation.

PROFESSIONAL PROFILE

MARK R. ZAYATZ, M.S., CPG, E.P.

PRINCIPAL SENIOR PROJECT HYDROGEOLOGIST

EXPERIENCE SUMMARY:

Mr. Zayatz has earned both a Bachelor of Arts and Master of Science degree in Geology, is a Certified Professional Geologist (CPG), Hydrogeologist, and an Environmental Professional. He is the Principal / Vice President and chief technical operations manager for the Brighton, Michigan office of Hydro-Logic Associates, Inc. (Hydro-Logic) an environmental consulting firm. Mr. Zayatz has 40+ years of experience as a consulting geologist, consulting hydrogeologist, mining geologist, client manager, environmental professional, and project manager, for contaminant investigation and remediation projects, water supply development and management, land use planning, real estate due-diligence, wastewater treatment development and evaluation, storm water investigation, and pollution prevention projects. His professional resume includes project work for the mining and aggregates industries, the petroleum industry, industrial gas manufacturing industry, site development and land use management, forest products, the insurance industry, public municipalities, private individuals, and 501(c)(3) Organizations.

His areas of consulting expertise include the assessment and remediation of environmental contamination at residential, commercial, and industrial sites; leaking underground or above ground chemical storage tank site management; site evaluation, mine planning, and permit compliance monitoring; water resource evaluation and development; real estate due-diligence investigation; baseline environmental assessments; brownfield evaluation and cleanup; wastewater assessment and treatment; risk-based corrective action (RBCA) evaluation and management; spill prevention audits and plans; regulatory compliance audits; special land use permitting issues; hazardous waste management; environmental site assessments; storm water site assessment and permitting; and as a senior technical resource and expert witness.

Mr. Zayatz has the necessary experience to provide a site-specific contaminant investigation, underground storage tank removal, evaluation, and management; environmental site assessment; water resource evaluation; ground water or surface water discharge evaluation; due-diligence investigation; and risk assessment or compliance audit for most environmental related projects. In addition, he possesses experience in current geologic and hydrogeologic principles; most current remedial engineering technologies; drilling and sampling operations; base metal, precious metal, and aggregate mining operations; surface and subsurface structural geology; RBCA assessment; and project regulatory closure.

EDUCATION AND PROFESSIONAL DEVELOPMENT:

EPA Risk Management Program
EPA / MDEQ Managing Chemical Risk Seminar
EGLE P.A. 451 Part 201 Workshops and Seminars
EGLE P.A. 451 Part 213 Workshops and Seminars
Project Management Training
Risk-Based Corrective Action (RBCA)
EPA / MDEQ Sampling Strategies and Statistical Applications Seminar
MDEQ Subdivision Rules Workshop
EGLE Volatilization to Indoor Air Pathway Workshop
OSHA HAZWOPER Training and Experience
MSHA Part 46 and Part 48 Training, Certification, and Experience

M.S., Geology, University of Alaska, Fairbanks - 1984
B.A., Geology, State University College of New York at Buffalo – 1981

PROFESSIONAL AFFILIATIONS AND REGISTRATIONS:

CPG - American Institute of Professional Geologists
CPG - State of Alaska
CPG - State of Indiana
CPG - State of Pennsylvania-Retired
CUSTP - Certified Underground Storage Tank Professional
EP - Environmental Professional per 40 CFR Part 312
Member, American Institute of Professional Geologists, Michigan
Member, American Association of Petroleum Geologists
Member, A.A.P.G. Division of Environmental Geoscientists
Member, National Water Well Association and Association of Ground Water Scientists and Engineers

REPRESENTATIVE PROJECT EXPERIENCE:

SOIL AND GROUND WATER INVESTIGATION AND REMEDIATION

- **Petroleum, Mining Industry, Forest Products, and Insurance Industry Clients - Numerous States:** Client manager, project manager, project hydrogeologist, peer consultant, or senior technical consultant on over 250 soil and ground water site investigation projects in over 20 states. Many projects involved either leaking underground or above ground chemical storage tanks or other point-source contamination. Activities included the investigation, remediation, and safe regulatory closure of sites with the potential to contaminate public or private drinking water supplies. Remediation technologies utilized included air sparging, soil vapor extraction, in-situ passive and active bioremediation, pump and treat, bio-piling, and source area excavation. Evaluated and remediated sites following state-specific closure requirements.

- **501(c)(3) Organization – Chelsea, Michigan:** Client manager, project manager, project hydrogeologist, peer consultant, and senior technical consultant for a 501(c)(3) Organization redeveloping a 100+ year-old contaminated former industrial property. Work with Michigan EGLE, EGLE Brownfields, State of Michigan Health Department, City of Chelsea, Washtenaw County Brownfields Redevelopment Authority, former property owner, current property owner, and Site developer to evaluate and mitigate property with soil contamination, ground water contamination, storm water contamination, abandoned underground storage tanks (USTs), and soil vapor impact. Ongoing project activities include the evaluation and closure of abandoned USTs; delineation, evaluation, excavation, and proper landfill disposal of contaminated soil; elimination of soil vapor impact; capping of the Site to eliminate soil, NAPL, and ground water Direct Contact concerns; and finally, construction of a City Park in its place.

- **Mining Industry Clients – Michigan, Ohio, Kentucky, Tennessee:** Senior technical consultant involving contaminant investigation and remediation of current and former mining site properties prior to operational upgrades or (re)development.

- **Municipal Clients - Michigan:** Senior technical consultant involving soil, ground water, and surface water contaminant investigation and remediation of contaminated properties using taxpayer dollars.

- **Industrial Gas, Forest Products and Mining Industry Clients - Michigan:** Client manager or project manager for the investigation, containment, and disposal of both EPA listed hazardous and non-hazardous wastes. Directed site investigation, contaminant definition, health and safety protocol, and disposal permitting and coordination.

- **Petroleum, Manufacturing, Mining, and Insurance Industry Clients - Numerous States:** Client manager, project manager, project hydrogeologist, project geologist, or senior technical consultant for RBCA project evaluations. Tasks included the identification of site contaminants, the evaluation of on-site and off-site receptors, calculation of risk-based cleanup criteria protective of off-site properties, the identification of compliance monitoring points, and preparation of a monitoring program acceptable to the state regulatory agency.

- **Property Development Clients - Numerous States:** Senior technical consultant involving contaminant investigation and remediation for brownfield and other properties being (re)developed as commercial sites.

- **Insurance Industry Clients - Michigan:** Senior technical consultant providing project peer review and oversight for investigation and clean-up activities proposed by other consultants.

MINE PERMITTING, DEVELOPMENT AND OPERATIONAL COMPLIANCE

- **Mining Industry Clients – Michigan, Texas, Oklahoma, Arizona, Pennsylvania, California:** Consulting geologist, consulting hydrogeologist, project geologist, project hydrogeologist, or senior technical consultant assisting clients in the evaluation and permitting of potential new mining properties or assistance in the continued regulatory compliance for existing mining properties.

  Activities include the completion of an initial "desktop" geological and/or hydrogeological evaluation of a site and the surrounding area including an assessment of the potential for economic aggregates mining within the Site area. This includes the assessment of the geological and hydrogeological data obtained and provided by the prospective aggregates company and the collection or recommended collection of additional data as necessary.

  The geologic data evaluation includes an assessment of all soil borings logs completed across a Property to determine the thickness of overburden, aggregates, and any interbedded clay material; review of provided standard grain size analysis; and comparison of this data to the raw material requirements to produce concrete sand (2NS), road and shoulder gravel (23A), pea stone, asphalt splits, masonry sand, Class II fill sand, Class III fill sand, and other construction materials necessary to evaluate the overall "quality and quantity" of the aggregates deposit.

  The hydrogeologic data evaluation includes identifying ground water and private water well usage in the immediate area; the siting, design, and directing the installation for ground water monitoring wells and production wells; the collection and evaluation of ground water "quality and quantity" data; the determination of baseline ground water conditions; the preparation and submittal of a site-specific hydrogeological investigation report; presentation, public hearing, regulatory discussion, and meeting support for the client; recommendations for continued ground water monitoring over the life of the mining properties to ensure protection of the ground water resource and regulatory compliance; and continued ground water sampling and independent reporting to the stakeholders and regulators.

PROPERTY TRANSACTION ASSESSMENT

- **Attorneys, Lending Institutions, Developers and Builders, and Industrial Clients - Numerous States:** Client manager, senior technical advisor, or project manager for over 300 Phase I and Phase II ASTM Standard Environmental Site Assessment (ESAs) in over 25 states.

- **Mining Industry Clients - Numerous States:** Client manager, senior technical advisor, or project manager for over 100 pre-purchase ASTM Standard Phase I and Phase II ESAs at sand & gravel, crushed limestone, and "hardrock" mining operations with and without asphalt and concrete plants, in over 10 states. Project scope was modified according to the clients' needs. Recommendations for addition work, cleanup, and compliance costs were estimated and provided to the client, as requested.

- **Manufacturing and Industrial Clients - Numerous States:** Client manager, senior technical advisor, or project manager for over 25 pre-purchase due-diligence investigations in over 10 states, covering over 50 individual project sites. Projects were completed according to the ASTM standard and the scope was modified according to the clients' needs.

- **Developers and Builders, and Commercial Clients - Michigan:** Client manager, senior technical advisor, or project manager for pre-purchase Baseline Environmental Assessments (BEAs) and brownfield site assessments in Michigan.

WATER RESOURCE EVALUATION AND DEVELOPMENT

- **Residential, Commercial, Industrial, and Recreational Development Clients - Michigan:** Project manager, project hydrogeologist, or senior technical consultant for over 50 private, industrial or municipal water supply projects. Met all applicable federal, state, and local health department requirements, including the completion of a Wellhead Protection Area Delineation, as necessary. Directed site investigation and background activities necessary to complete a site evaluation, provide recommendations, and assist in the design and completion of water supply wellfield sites.

- **Residential and Commercial Development Clients - Michigan:** Project manager, project hydrogeologist, or senior technical consultant for the evaluation of development sites with the potential to have its water supply impacted by off-site contaminant sources. Directed site investigation and background activities necessary to evaluate the issues and provide professional opinions.

- **Mining Industry Clients – Arizona, Oklahoma, Ohio, Texas:** Project manager, project hydrogeologist, or senior technical consultant for (5) industrial water supply wellfields. The largest wellfield located in West Texas, included 12 production wells that could be remotely operated using telemetry. The daily activities for this project included the management of a $10 million project investment and budget. Met all applicable federal, state, and local health department project requirements. Directed preliminary site investigation activities necessary to evaluate, make recommendations, design, equip, complete, and manage the water supply wellfield sites. Provided necessary data, project findings, and professional opinions to client and all regulating agencies.

STORM WATER SITE EVALUATION

- **Residential, Commercial, and Industrial Clients - Numerous States:** Project manager, project hydrogeologist, or senior technical consultant for over 250 private, commercial or industrial storm water site assessment projects for sites in over 40 states. Met all applicable federal, state, and local project requirements, as necessary. Site investigation and sampling, regulatory advice, review and assistance with state-specific storm water permits, Notice of Intents (NOIs), and Storm Water Pollution Prevention Plans (SWPPPs) were completed, as necessary.

REGULATORY COMPLIANCE

- **Manufacturing Industry and Forest Products Clients - Numerous States:** Client manager, project manager and team member performing regulatory compliance audits for corrugated box plants, air separation, industrial gases, and metal coatings facilities. Included investigation of air emissions, wastewater, storm water, spill prevention, hazardous waste disposition, underground and above ground storage tanks, operations system permitting issues, and industrial process management. Cost-saving, process improvement, and waste minimization ideas were provided.

- **Petroleum Industry Client - Michigan:** Project manager and team member performing a pre-purchase assessment and a regulatory compliance review for a gas fractionation and storage, pipeline, and terminal facility. Issues that were investigated included air emissions, wastewater, storm water, hazardous waste disposition, underground and above ground storage tanks, regulatory permitting issues, and industrial process management.

- **Manufacturing, Forest Products, and Mining Industry Clients - Numerous States:** Project manager and team member performing the assessment and completion of over 200 individual Storm Water Pollution Prevention Plans (SWPPPs) and / or Spill Prevention and Countermeasure Control (SPCC) Plans for sites in over 40 states. Assisted the facility in corrective action measures, as necessary.

WASTEWATER TREATMENT PLANT SITE EVALUATION AND DEVELOPMENT

- **Residential and Commercial Development Clients - Michigan:** Project manager, project hydrogeologist, or senior technical consultant for private or municipal wastewater treatment plant or individual septic development projects. The largest project evaluated was able to provide service to the population of an entire township within Michigan. Met all applicable federal, state, and local health department project requirements. Provided necessary data, project findings, and professional opinions to all regulating agencies.

STORAGE TANK MANAGEMENT AND CLEANUP

- **Insurance Industry and Private Residential Clients - Michigan:** Project manager for the assessment, remediation, and regulatory closure of fuel oil or other petroleum product spills that resulted in contaminated soils and/or ground water and petroleum hydrocarbon vapors both inside and outside of private residences. Emergency response activities were performed at residences.

- **Residential, Commercial, and Industrial Clients - Numerous States:** Project manager for the assessment, removal, remediation, and regulatory closure of out-of-service underground and above ground storage tanks.

EXPERT WITNESS AND TESTIMONY

- **Industrial Clients and Attorneys - Michigan:** Expert testimony and project support as a technical resource and/or as an expert witness during pre-litigation meetings, public hearings, and trial. Provided technical support through both the collection of meaningful data and public presentation of the findings.

Ric Davis

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Tuesday, June 10, 2025 10:39 AM
To: Ric Davis
Cc: Deciechi, Kayla
Subject: [EXTERNAL] Annual Permit Payments for Valentine and Holly Sand & Gravel
Attachments: DOC091824-09182024110624[81].pdf; Unknown.png

Supervisor Davis,

Thank you for contacting me regarding Holly Sand & Gravel (Holly). As you know, Holly operates in both Springfield and Groveland Townships. Former Supervisor Moreau previously explained to me that Springfield officials did not conduct annual inspections of our Holly site because it began operating before Springfield Township changed its ordinances and was, therefore, grandfathered in. I can't speak to the validity of that statement or logic; I'm simply sharing what I was told. We are more than happy to host Springfield officials for inspections of our Holly site, please suggest dates/times for a visit.

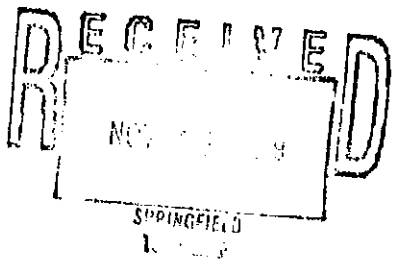
Attached to this email please find a previous note, and proof of payment, made for BMC's annual permit fees for both the Holly and Valentine sites in 2019. Please also find a copy of proof of permit payments made for 2024 and 2025. As you will see in the screen grab, we show $1,200 paid to Charter Township of Springfield and the bank indicates payment as 'Reconciled', meaning cashed.

As an aside, Supervisor Moreau explained to me in 2024 that through the change in administrations (from Supervisor Walls to her) requesting annual fees from BMC was missed. When she brought this to my attention, I asked if she wanted us to issue missed payments for years 2020-2023. She said that was not necessary, instead requesting payment for 2024 and prepayment for 2025.

Please let me know of any further questions.

Thank you,
Reuben

Original to Treasurer (Clerk)



November 21, 2019

Mr. Collin W. Walls
Supervisor
Springfield Township Civic Center
12000 Davisburg Road
Davisburg, MI 48350

Re: Renewal fees for mining operations

Dear Mr. Walls,

Please find enclosed a check for $600.00, to cover the renewal fees for our two mining sites in Springfield Township on Andersonville Road (Section 26), and Tindall Road (Sections 4 & 5), respectively.

Should you have questions or comments, please feel free to contact me.

Sincerely,

Dale W. Sawyer

Burroughs Materials Corporation
Edw. C. Levy Co.

DATE: 14-NOV-19 REMITTANCE ADVICE FROM : Burroughs Materials Corporation CHECK NO: [redacted]

INVOICE NO.	INVOICE DATE	PO	DESCRIPTION	GROSS AMOUNT	DISCOUNT	NET AMOUNT
111119CRDS	11-NOV-19	3W	PERMIT FEE	600.00	.00	600.00

RECEIVED

PLEASE DETACH AND RETAIN THIS STATEMENT AS YOUR RECORD OF PAYMENT. 600.00 .00 600.00

THIS CHECK IS VOID WITHOUT A PURPLE & BLUE BORDER AND BACKGROUND PLUS A KNIGHT & FINGERPRINT WATERMARK ON THE BACK - HOLD AT ANGLE TO VIEW

Falcon Trucking Company

Burroughs Materials Corporation
51445 W. 12 MILE
WIXOM, MICHIGAN 48393

JPMorgan Chase Bank, N.A
Columbus, OH [redacted]

CHECK DATE	CHECK NUMBER	CHECK AMOUNT
14-NOV-19	[redacted]	**********600.00

Burroughs Materials Corporation

Six Hundred Dollars And Zero Cents**********

PAY TO THE ORDER OF
Charter Township of Springfield
12000 Davisburg Rd
Davisburg,MI 48350

12619

S. Evan Meier
Edward C. Rust Jr.
AUTHORIZED SIGNATURES

[redacted] [redacted] [redacted]

Ric Davis

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Tuesday, June 10, 2025 9:35 AM
To: Ric Davis
Subject: [EXTERNAL] FW: **EXTERNAL**RE: Springfield Twp Bond Renewal
Attachments: DOC091824-09182024110624.pdf

From: Laura Moreau <lmoreau@springfield-twp.us>
Date: Wednesday, September 18, 2024 at 11:27 AM
To: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Subject: **EXTERNAL**RE: Springfield Twp Bond Renewal

Hi Reuben—Great chatting with you earlier. A copy of last payment received is attached as we discussed.

Laura Moreau, Supervisor
Springfield Township
12000 Davisburg Road
Davisburg, MI 48350
248-846-6502

SPRINGFIELD
CHARTER TOWNSHIP

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Tuesday, January 2, 2024 3:46 PM
To: Laura Moreau <lmoreau@springfield-twp.us>
Cc: Deciechi, Kayla <kdeciechi@levynet.com>
Subject: [EXTERNAL] Springfield Twp Bond Renewal

Happy 2024 Ms. Moreau,

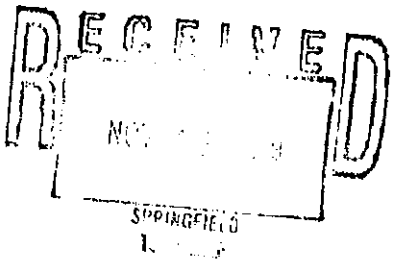
I hope you had wonderful holidays and were able to spend time with your kids. Attached to this email please find our bond renewal for 2024.

As things settle down following the holidays I'd love to find a time to get together to catch up. Please suggest some dates/times in February or March that work for you. I look forward to catching up soon.

Warmly,
Reuben

Reuben Maxbauer
Edw. C. Levy Co.
313.405.4255

Original to Treasurer (Clerk)



November 21, 2019

Mr. Collin W. Walls
Supervisor
Springfield Township Civic Center
12000 Davisburg Road
Davisburg, MI 48350

Re: Renewal fees for mining operations

Dear Mr. Walls,

Please find enclosed a check for $600.00, to cover the renewal fees for our two mining sites in Springfield Township on Andersonville Road (Section 26), and Tindall Road (Sections 4 & 5), respectively.

Should you have questions or comments, please feel free to contact me.

Sincerely,

Dale W. Sawyer

Burroughs Materials Corporation
Edw. C. Levy Co.

DATE: 14-NOV-19 REMITTANCE ADVICE FROM : Burroughs Materials Corporation CHECK NO: [redacted]

INVOICE NO.	INVOICE DATE	PO	DESCRIPTION	GROSS AMOUNT	DISCOUNT	NET AMOUNT
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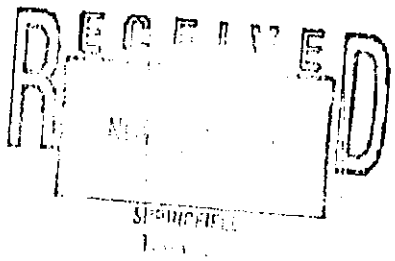

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Falcon Trucking Company

Burroughs Materials Corporation
61445 W. 12 MILE
WIXOM, MICHIGAN 48393

JPMorgan Chase Bank, N.A
Columbus, OH [redacted]

CHECK DATE	CHECK NUMBER	CHECK AMOUNT
14-NOV-19	2006541	**********600.00

Burroughs Materials Corporation

Six Hundred Dollars And Zero Cents**********

PAY TO THE ORDER OF
Charter Township of Springfield
12000 Davisburg Rd
Davisburg,MI 48350

12619

S. Evan Meiner
Edward C. Rugi
AUTHORIZED SIGNATURES

Ric Davis

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Friday, June 6, 2025 9:21 PM
To: Christine Rogers
Cc: Ric Davis
Subject: [EXTERNAL] Re: **EXTERNAL**Mine Tours

Christine,

Thank you very much for your help arranging visits. We can accommodate a total of 38 participants per visit. 10:30am start times work well. The address is 275 Ray Road, Oxford, MI.

We recommend closed toe shoes or boots as walking surfaces and conditions may be uneven or muddy.

Children are welcome, so long as they are accompanied by a parent or guardian.

The tour lasts approximately 2 hours, it depends on how many questions are asked.

Attendees can certainly bring water, we will do our best to provide the same.

Please share the names of all attendees prior to the visits so we can make preparations.

Thanks again, I really appreciate your help and partnership. I hope this isn't an undue burden on you.

Let's connect Monday if you have any questions. I'm sorry I missed your call earlier today.

Have a great weekend,
Reuben

> On Jun 6, 2025, at 3:52 PM, Christine Rogers <crogers@springfield-twp.us> wrote:
>
> Reuben,
>
> I will need to get the Supervisor opinion. I want to have all the details in order before people start signing up.
>
> How many people per tour?
> What time to arrive? Address
> How long is the tour?

Is there any kind of dress code?
Should the attendees bring water to drink?
Are children welcome?

Thank you,
Christine

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Friday, June 6, 2025 3:36 PM
To: Christine Rogers <crogers@springfield-twp.us>
Subject: [EXTERNAL] Re: **EXTERNAL**Mine Tours

Hi Christine,

Thank you for your help coordinating. June 17th and 18th work for us. Please let me know if that works for the attendees. If so, we'll schedule it!

Thanks,
Reuben

On Jun 6, 2025, at 2:28 PM, Christine Rogers <crogers@springfield-twp.us> wrote:

Good afternoon, Reuban,

I hope you are doing well. Ric asked me to contact you regarding residents attending the mine tour. Can you please inform me if you have set any plans (time/place) when this will happen.
I am getting requests for information.

Thank you,
Christine

<image001.png>

ATTENTION:

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Tuesday, June 3, 2025 10:47 AM
To: Julia Upfal <jupfal@giffelswebster.com>; Bob Doyle <Bob.Doyle@smithgroup.com>; Christine Rogers <crogers@springfield-twp.us>
Cc: Stephanie Osborn <sosborn@giffelswebster.com>; Jason Mayer <jmayer@giffelswebster.com>; Nancy McClain <nmcclain@giffelswebster.com>; Ric Davis <rdavis@springfield-twp.us>; Sean Miller <smiller@springfield-twp.us>
Subject: [EXTERNAL] Re: **EXTERNAL**RE: Levy gravel pit

Julia,

Thank you for your clarification. We will pull that information together and send it your way.

Thank you for all of your help - I know this is a lot!
Reuben

From: Julia Upfal <jupfal@giffelswebster.com>
Date: Tuesday, June 3, 2025 at 10:39 AM
To: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>, Bob Doyle <Bob.Doyle@smithgroup.com>, Christine Rogers <crogers@springfield-twp.us>
Cc: Stephanie Osborn <sosborn@giffelswebster.com>, Jason Mayer <jmayer@giffelswebster.com>, Nancy McClain <nmcclain@giffelswebster.com>, Ric Davis <rdavis@springfield-twp.us>, Sean Miller <smiller@springfield-twp.us>
Subject: RE: **EXTERNAL**RE: Levy gravel pit
Hi Reuben,

The ordinance states, " The applicant shall submit a report prepared by a geologist and/or other experts with appropriate credentials to demonstrate compliance with MCL 125.3205, as amended, that the natural resources to be extracted shall be considered valuable, and the applicant can receive revenue and reasonably expect to profit from the proposed mineral mining operation. The applicant shall also provide documentation to demonstrate that there is a need for the natural resources to be mined by either the applicant or in the market served by the applicant."

Exhibit C in the application here is the response to this requirement. The geologist who provided this report was not identified, but it should have been completed by a qualified expert. Exhibit C states that data collected from soil borings and observation wells resulted in a determination that the geologic resources found on the site are a viable source of materials to produce construction grade quality aggregate. We would like to conduct an independent review of these studies, but were not provided the data.

In addition, this exhibit talks about the Holly Road site, but without evidence or specificity regarding the remaining capacity of this site. In addition, it should address the capacity of neighboring mines in Oakland County.

Please call me if you would like to discuss. I think that further studies to demonstrate the resource need will be crucial.

Julia

Julia Upfal, AICP
Senior Planner

giffels webster

Giffels Webster
1025 E. Maple, Suite 100
Birmingham, MI, 48009
p: 248.852.3100
f: 313.962.5068

Crain's Best Places to Work in Southeast Michigan 2024

jupfal@giffelswebster.com
www.giffelswebster.com
privacy policy

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Tuesday, June 3, 2025 8:14 AM
To: Julia Upfal <jupfal@giffelswebster.com>; Bob Doyle <Bob.Doyle@smithgroup.com>; Christine Rogers <crogers@springfield-twp.us>
Cc: Stephanie Osborn <sosborn@giffelswebster.com>; Jason Mayer <jmayer@giffelswebster.com>; Nancy McClain <nmcclain@giffelswebster.com>
Subject: Re: **EXTERNAL**RE: Levy gravel pit

Good morning, Julia,

Please send me a copy of the report you are referencing so I can be sure we supply you with what you are requesting.

Thank you!
Reuben

From: Julia Upfal <jupfal@giffelswebster.com>
Date: Monday, June 2, 2025 at 7:49 PM
To: Bob Doyle <Bob.Doyle@smithgroup.com>, Christine Rogers <crogers@springfield-twp.us>, Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Cc: Stephanie Osborn <sosborn@giffelswebster.com>, Jason Mayer <jmayer@giffelswebster.com>,

Nancy McClain <nmcclain@giffelswebster.com>
Subject: **EXTERNAL**RE: Levy gravel pit
Hi Bob and Reuben,

The Geological Report in Exhibit C includes a summary of findings, can you provide the data/study to support these findings?

Julia

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Senior Planner

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From: Bob Doyle <Bob.Doyle@smithgroup.com>
Sent: Monday, June 2, 2025 2:28 PM
To: Julia Upfal <jupfal@giffelswebster.com>; Christine Rogers <crogers@springfield-twp.us>
Cc: Stephanie Osborn <sosborn@giffelswebster.com>; Reuben Maxbauer <RMAXBAUER@edwclevy.net>
Subject: Re: Levy gravel pit

Since the project is privately funded and does not involve public land, an EIS is not required by the federal government. I asked Tom Green at Levy about the NPDES permit required by this project triggering an EIS, and he reported that it does not.

I would note that the assessments which have been submitted represent the core of the EIS subject matter relative to this type of project.

I'm copying Rueben here since I am in the Upper Peninsula until Thursday and my responses may not be as timely as you need!

BOB DOYLE
Landscape Architect, ASLA
Senior Principal

SmithGroup

201 Depot St., Second Floor
Ann Arbor, MI 48104

T 734.669.2695 C 734.548.0408
bob.doyle@smithgroup.com

smithgroup.com

Connect with us
LinkedIn | Facebook | Twitter | Instagram

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Sent: Monday, June 2, 2025 11:12 AM
To: Christine Rogers <crogers@springfield-twp.us>
Cc: Stephanie Osborn <sosborn@giffelswebster.com>; Bob Doyle <Bob.Doyle@smithgroup.com>
Subject: RE: Levy gravel pit

Hi Christine,

They are providing all require studies by the Township, which so far has included a groundwater study, natural resource inventory, and traffic study (attached). In addition, the letter they've provided (attached) addresses off site impacts. Additional information will be provided with the forthcoming submission.

As a part of this project, they are required to obtain outside agency permits, and an EIS will likely be required for the NPDES permit. The township does not have regulatory authority over the EIS, but if there is a link to the EPA permit review process that may be helpful to provide and we can check with Bob. I am copying him here to see if he has any additional thoughts on this request- Bob, a resident asked about an EIS.

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Ric Davis

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Sent: Tuesday, June 3, 2025 10:47 AM
To: Julia Upfal; Bob Doyle; Christine Rogers
Cc: Stephanie Osborn; Jason Mayer; Nancy McClain; Ric Davis; Sean Miller
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Crain's Best Places to Work in Southeast Michigan 2024

jupfal@giffelswebster.com
www.giffelswebster.com
privacy policy

ATTENTION:
This email was sent to the Levy Group of Companies from an external source. Please be extra vigilant when opening attachments or clicking links.

Ric Davis

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Tuesday, June 3, 2025 7:54 AM
To: Chris Comstock
Cc: Ric Davis
Subject: [EXTERNAL] 2002 DEQ Wetland Assessment Report
Attachments: DEQ WAP Ltr 10.18.02[29].pdf

Good morning,

Chris and Supervisor Davis, attached, please find the 2002 DEQ Wetland Assessment Report for BMC's Field/Ormond Road property. Please note, this assessment is in reference to the entirety of the property, not only the area BMC proposes to mine.

Thank you,
Reuben

02038

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
SOUTHEAST MICHIGAN DISTRICT OFFICE

JOHN ENGLER
GOVERNOR

RUSSELL J. HARDING
DIRECTOR

October 18, 2002

Burroughs Materials Company
51445 West 12 Mile Road
Wixom, MI 48393

ATTENTION: Mr. Ed Clements

Dear Mr. Clements:

SUBJECT: Wetland Assessment Report
Wetland Assessment File Number: 02-63-0028-WA

The Department of Environmental Quality (DEQ) conducted on September 19, 2002, a Level 3 Wetland Assessment on property (property tax identification number 06-24-400-004) located in Town 04N, Range 07E, Section 24, within Rose Township, Oakland County. The assessment was conducted in accordance with Part 303, Wetland Protection of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); and Rule 4, Wetland Assessments (R 281.924) of the Administrative Rules for Part 303. This is a report of our findings in response to your wetland assessment application.

The DEQ staff observed all of the flagged boundaries with your consultant Woody Held of King and MacGregor Environmental, Inc, as requested in your wetland assessment application. Based on our on-site investigation, which included review of plant communities, hydrologic indicators, and soils of the assessment area, and an in-office review of other pertinent information, **the DEQ finds the subject parcel contains state-regulated wetlands and a state-regulated lake.** The DEQ is in agreement with all boundaries as flagged. Enclosed is a site map of the assessment area that was created by combining information from your consultant and the DEQ. This map identifies all state-regulated wetlands, one state regulated lake, non state-regulated wetlands, and non regulated upland areas within the assessment area.

The areas below have been identified as state-regulated wetland, or as a state-regulated lake on the site map.

1. Wetlands AA, AC, BB, B, CC, D, EE, E, FF, F, GG, G, HH, H, II, K, L, LE, V.
2. One State-regulated lake consisting of 9.15 acres.

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OCT 23 2002

Your assessment area does not appear to be within those areas also regulated by the USACE. However, should you desire more information, please contact the USACE at 313-226-2218.

This assessment report is limited to findings pursuant to Part 303 and does not constitute a determination of jurisdiction under other DEQ administered programs. Any land use activities undertaken on the assessed parcel may be subject to regulation pursuant to the NREPA under the following programs:

Floodplain Regulatory Authority found in Part 31, Water Resources Protection
Part 91, Soil Erosion and Sedimentation Control
Part 301, Inland Lakes and Streams

The findings contained in this report do not convey, provide, or otherwise imply approval of any governing act, ordinance, or regulation, nor does it waive the obligation to acquire any applicable state, county, local, or federal approval or authorizations necessary to conduct any possible activities. This assessment report is not a permit for any activity that requires a permit from the DEQ.

The findings contained in this report are binding on the DEQ until September 19, 2005, a period of three years from the date of the assessment unless a reassessment is conducted. Please contact me if you have any questions regarding this assessment report.

Sincerely,

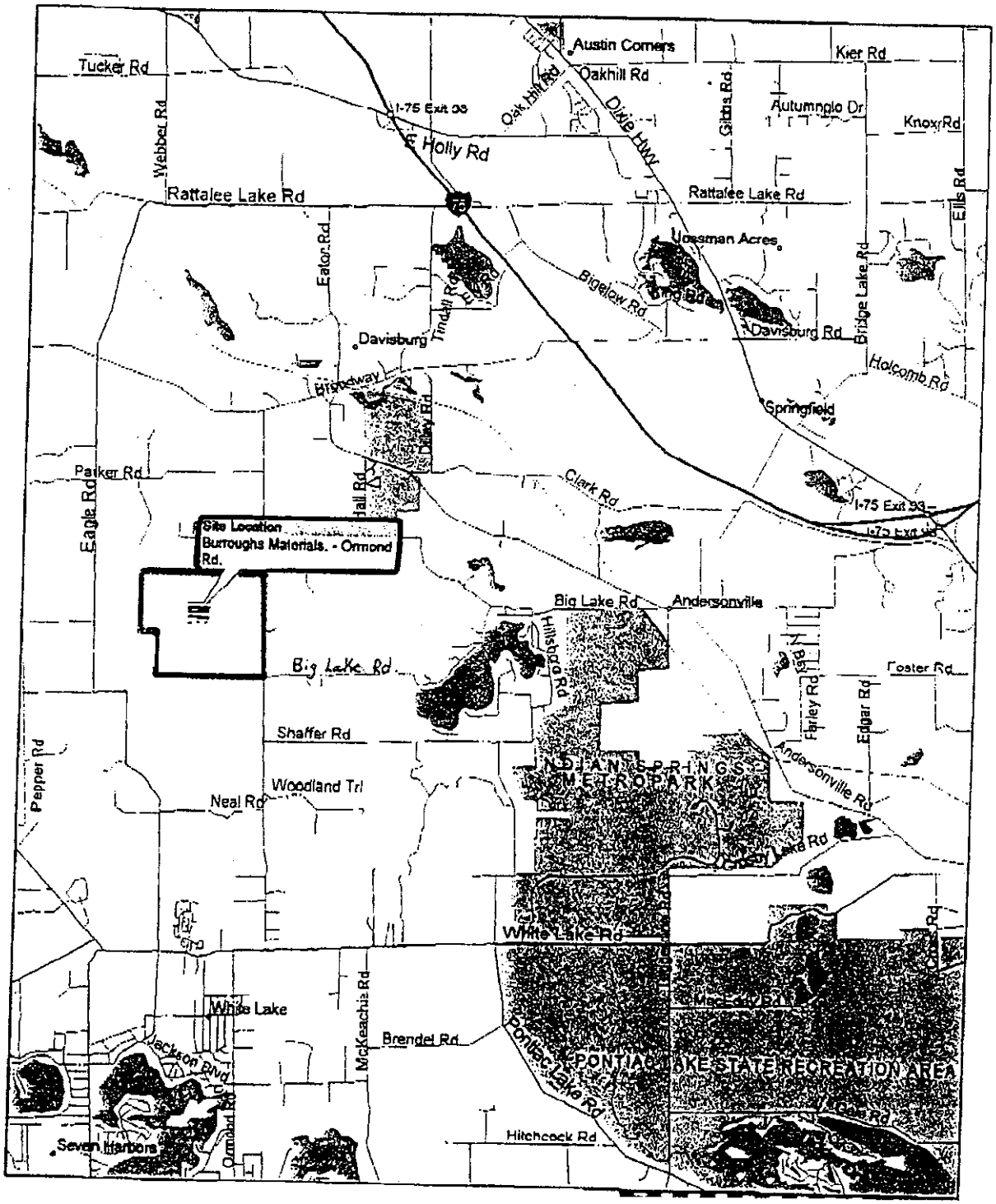
Mary Vanderlaan

Mary Vanderlaan
District Supervisor
Geological and Land Management Division
734-953-1465

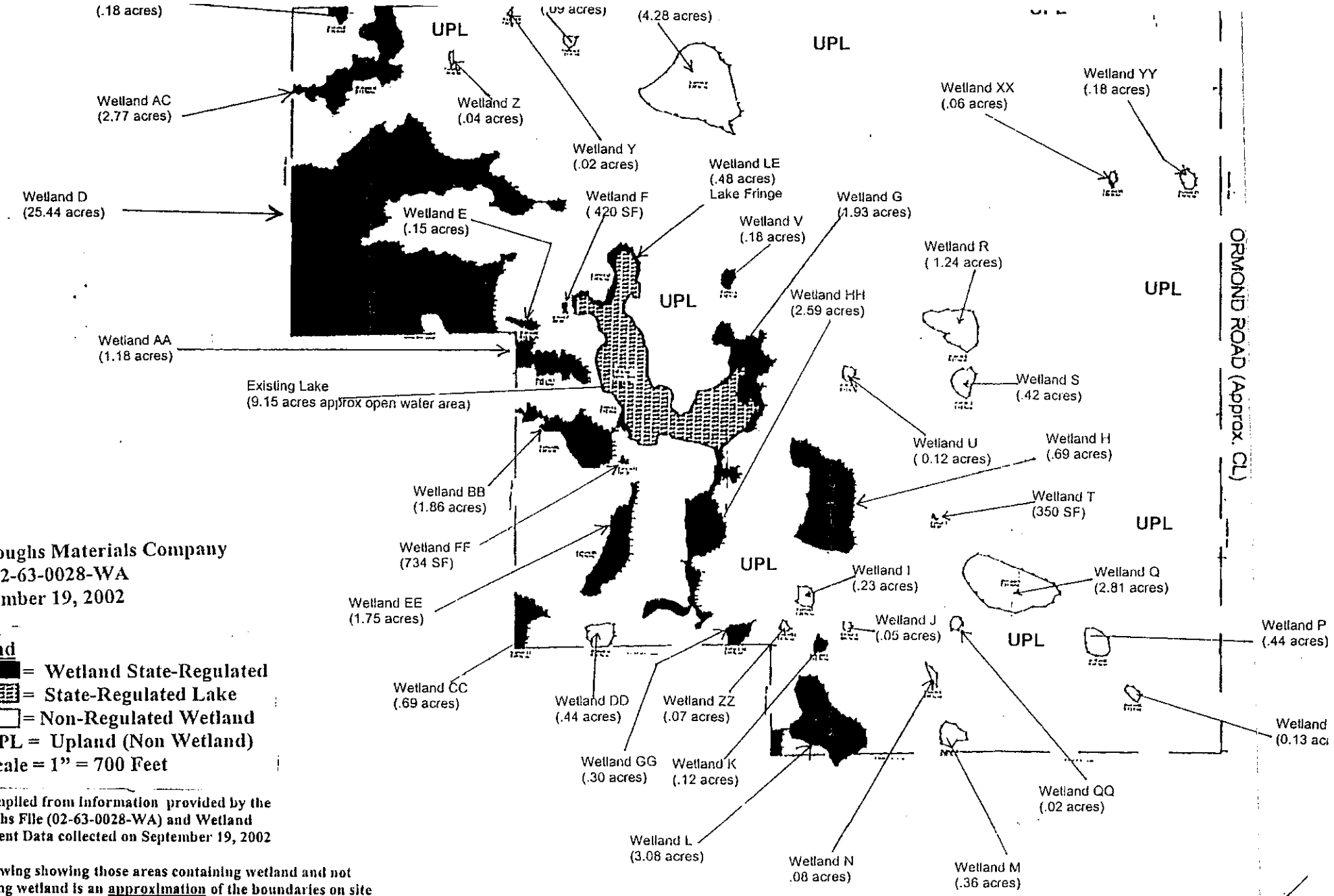
Enclosures

cc: Mr. Woody Held, King and MacGregor Environmental, Inc.,
Ms. Wendy Veltman, DEQ
Mr. Todd Losee, DEQ

Location Map Burroughs Materials - Ormond Rd.



Site
Burroughs Materials Company
File 02-63-0028-WA
September 19, 2002
482.0 Acres



Burroughs Materials Company
File 02-63-0028-WA
September 19, 2002

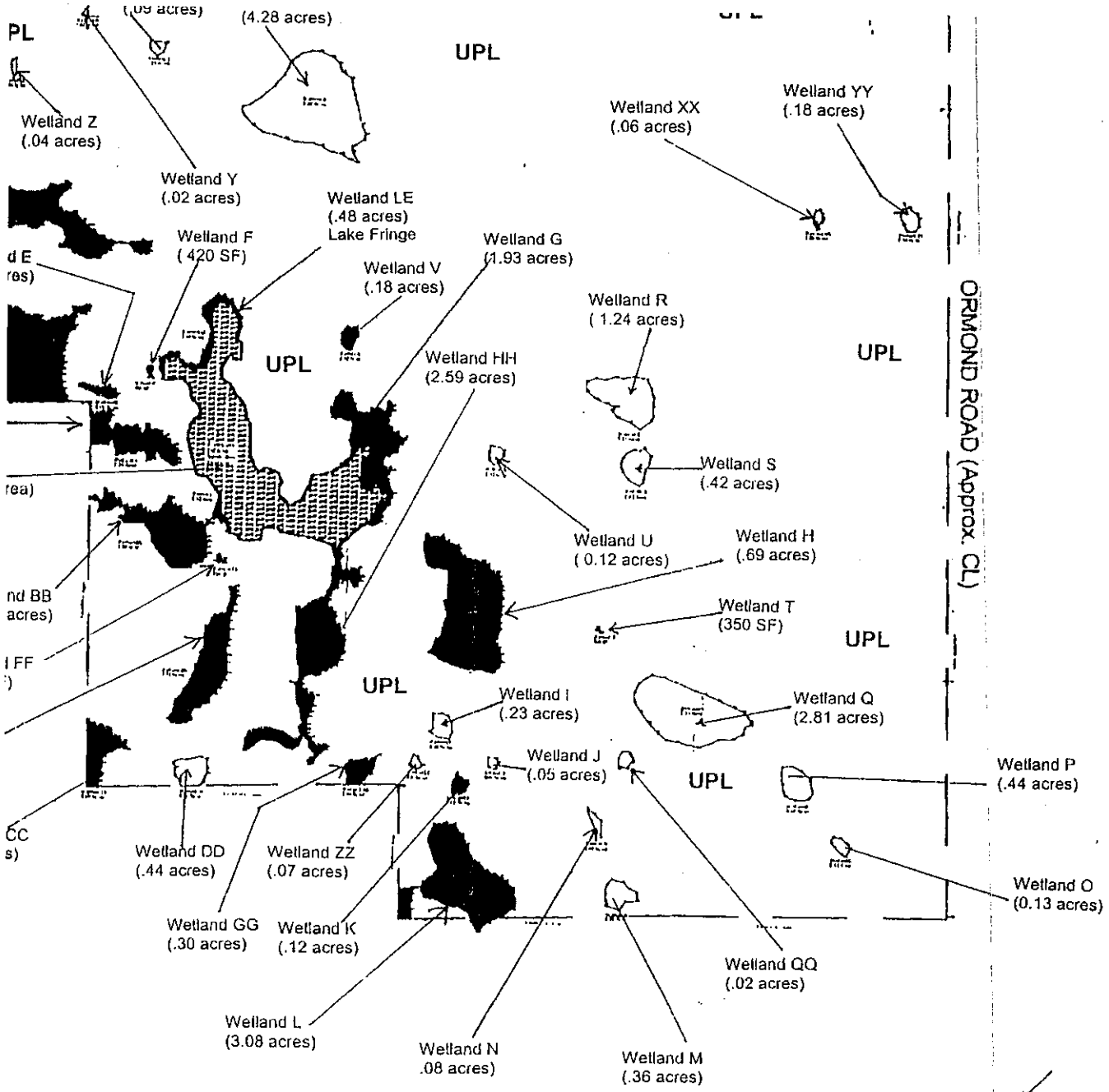
Legend

= Wetland State-Regulated
= State-Regulated Lake
= Non-Regulated Wetland
UPL = Upland (Non Wetland)
Scale = 1" = 700 Feet

Map compiled from information provided by the Burroughs File (02-63-0028-WA) and Wetland Assessment Data collected on September 19, 2002

This Drawing showing those areas containing wetland and not containing wetland is an approximation of the boundaries on site Wetland boundaries should be surveyed to reflect a true representation of wetland and upland on site. This drawing does not authorize or permit activities requiring a permit in accordance with Part 303 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Mark



Mark V. Bahr
9-19-2002

Ric Davis

From: Ric Davis
Sent: Monday, June 2, 2025 6:36 PM
To: Maxbauer, Reuben
Subject: Re: Township Contacts

Hi Reuben,

Thank you for promptly providing the list of communities where your sand and gravel mining operations are active, along with the local supervisors you've worked with. I appreciate the transparency and your commitment to maintaining cooperative relationships with local governments.

As we continue to explore what's best for Springfield Township, I'm especially interested in learning more about how those communities have balanced economic activity with environmental responsibility and resident concerns. I plan to reach out to those supervisors to better understand the dynamics of those partnerships.

Thanks again, and I look forward to continued dialogue.

Best regards,

Ric Davis

Supervisor, Springfield Township

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From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Monday, June 2, 2025 4:52:10 PM
To: Ric Davis <rdavis@springfield-twp.us>
Subject: [EXTERNAL] Township Contacts

Supervisor Davis,

You requested a list of communities in which we operate sand and gravel mines and within which we work closely with the local units of government. Below, please find that list:

- Oxford, MI: Supervisor Jack Curtis
- Highland, MI: Supervisor Rick Hamill
- Milford, MI: Supervisor Donald Green
- Groveland, MI: Supervisor Kevin Scramlin

Thank you,
Reuben

Ric Davis

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Monday, June 2, 2025 4:52 PM
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- Oxford, MI: Supervisor Jack Curtis
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- Milford, MI: Supervisor Donald Green
- Groveland, MI: Supervisor Kevin Scramlin

Thank you,
Reuben

Ric Davis

From: Maxbauer, Reuben <RMAXBAUER@edwclevy.net>
Sent: Thursday, May 29, 2025 4:52 PM
To: Ric Davis
Cc: Deciechi, Kayla
Subject: [EXTERNAL] FAQ and Timeline
Attachments: Springfield Timeline.docx; Frequently Asked Questions.docx

Supervisor Davis,

Attached, please find both an FAQ and Timeline. Please let me know if anything is unclear. I appreciate your assistance sharing this with the community.

Thank you!
Reuben

Frequently Asked Questions

What is the proposed haul route?

A. The haul route is Ormond Road north to Davisburg Road west, a Class A MDOT Truck Route. Access to and from the site will be from the west side of Ormond Road, approximately 1.3 miles south of Davisburg Road.

How will you protect the wildlife?

A. The area to be mined is currently active farmland, leading to limited wildlife habitat in the proposed mining area. Wildlife will continue to use thousands of acres within Springfield Township, including natural areas on Burroughs Materials Corporation's (BMC) property that will be preserved. As an additional safeguard, if deemed appropriate, exclusionary fencing can be installed to prevent species from accessing the mining area. Environmentally friendly erosion control measure, utilizing natural materials, and vegetation consistent with the region will be utilized to prevent impacts to wildlife visiting from offsite locations.

What are the hours of operation?

A. Springfield Township Ordinance dictates operating hours of 6:00 AM to 7:00 PM (extended to 8:00pm during DST) Monday through Saturday. Operations are prohibited on Sunday.

Isn't Davisburg Road through downtown an approved truck route?

A. Yes, it is. However, various members of Springfield Township have expressed their concerns about truck traffic through the downtown area. Therefore, trucks will be routed westward on Davisburg Road.

What will happen to the property when the mining is complete?

A. Mining and reclamation will occur concurrently. The goal is to mine to a predetermined and pre-approved plan that converts the land into an aesthetically pleasing, valuable land use that suits the overall need and character of the Township. The current plan for post mining, which is subject to change, is for residential development.

Why can't BMC conduct their mining operations elsewhere?

A. BMC considered a range of sites in the region for sand and gravel operations. The site selection criteria utilized in this process includes:

1. Availability of Quality Aggregate Materials: Geological investigations performed by BMC have demonstrated that the reserves at the Project Site are significant in quantity and high in quality.

2. Proximity to Market: A significant factor in the cost of construction aggregates is the distance from the source of materials to the market. The proposed Project Site is located in an area of southeastern Michigan that is undergoing and/or anticipating substantial growth and development. Longer trucking distances result in higher construction costs which are passed on to the consumer (often taxpayers). In fact, the cost of transportation of aggregates often equals or exceeds the cost of the materials.

3. Access to the Regional Transportation System: The Project Site has close access to Class A haul routes, linking directly to M-59. This, in turn, provides ready access to many local customers as well as I-75 and US-23.

4. Site Logistics: A parcel of land must have a size and configuration that is suitable for the efficient extraction of sand and gravel from the ground, both in terms of the property dimensions and in the depth of the clay overburden that typically lies between the topsoil and the sand and gravel deposit. The Project Site meets these criteria.

Will the mining impact regulated wetlands?

A. There are no anticipated direct impacts to the regulated wetlands on the Project Site.

Will the mining destroy forested areas?

A. No. The mining plan has been designed to occur primarily on land that is currently farmed.

Can I visit a mine?

A. Absolutely. BMC is eager to host residents looking to learn more about what happens in a sand and gravel mine, as well as those looking to better understand life around a mine site.

How can the public participate in the review of the proposal by the Township?
A. The public can participate by attending Public Hearings scheduled by the Planning Commission and Township Board. Please contact Springfield Township for further details.

Will BMC post a bond to guarantee reclamation of the property?
A. Yes. BMC will post a $2,500 reclamation bond per acre of mined land.

Will BMC post a road bond along Ormond Road?
A. Yes. The Road Commission for Oakland County (RCOC) will determine the value of the bond it will require from BMC and will maintain possession of the bond through the life of the project.

How long will the mining last?
A. BMC expects the mine to provide aggregates for 20 years, subject to market conditions.

Will the project generate excessive dust?
A. BMC anticipates that dust will be minor and within regulatory limits set by the appropriate governing bodies. Any increase in fugitive dust levels generated by site activities will be controlled through standard mitigation practices.

Will the project create excessive noise?
A. The Springfield Township Ordinance sets standards for acceptable limits of noise from operations and activities that may be of nuisance to the community based on land use zone. The proposed sand and gravel mining operation will meet Springfield's noise level standards.

Will the mine site impact my well?
A. No. BMC engaged hydrogeologists at Barr Engineering to study the mine's proposed impact on the water table. Barr analyzed approximately 20 years' worth of data from 25 on-site monitoring wells. Their analysis found that the proposed operation does not anticipate any negative impacts to 1) the shallow aquifer groundwater elevation and flow, 2) area residential wells, or 3) the natural resources which are dependent on groundwater (e.g. lakes and wetlands). BMC will continue to monitor groundwater levels to confirm this analysis during operations.

What about truck traffic?

A. BMC engaged Fishbeck to conduct a traffic study to assess potential traffic impacts to the local road network, and to establish a safe location for the entrance into the proposed mining operation. The study concluded that the additional truck traffic would have very little impact to the flow of traffic.

General Timeline of BMC's activities at the Field Site, Ormond Road, Springfield Twp.

1974: Land drilled for sand and gravel reserve analysis
1989: Land acquired
2001: Land drilled for sand and gravel reserve analysis
2002: Land drilled for sand and gravel reserve analysis
2002: King & Macgregor Environmental Wetland Delineation, confirmed by MDEQ (now EGLE)
2002: 5 groundwater monitoring wells installed
2003: Land drilled for sand and gravel reserve analysis
2017: 20 groundwater monitoring wells installed
2022: Meet with Springfield Township Supervisor regarding plans to mine the site
2022: Land drilled for sand and gravel reserve analysis
2023: Land drilled for sand and gravel reserve analysis
2023: Toured Springfield Township's Shiawassee Basin Preserve with the Township Supervisor, Township Natural Resource Specialist, and Barr Engineering to better understand the Community's Natural Resource priorities
2023: Barr (formerly King & Macgregor Environmental) performed wetland delineation and threatened and endangered analysis
2023-2025: Barr completed hydrologic and hydrogeologic evaluations of the mine's proposed impact on surface water and groundwater
2018-2024: Bergmann, and later Fishbeck conducted traffic study and analysis