

Hayes Township, Charlevoix County, Planning Commission

Regular Meeting of Planning Commission

January 17, 2023 7:00 pm

Hayes Township Hall

9195 Major Douglas Sloan Road

Charlevoix, Michigan 49720

<https://us02web.zoom.us/j/82286576345?pwd=MCtOektIT3krWHdnTzV0bHRoWUM1QT09>

Meeting ID: 822 8657 6345

Passcode: 726052

+1 312 626 6799 US (Chicago)

AGENDA

Call to Order

Pledge of Allegiance

Review of Agenda

Declarations of Conflict of Interest

Approval of Minutes Regular Meeting Draft December 13, 2022

Presentation by Kyle Ulrich, Northwestmihabitat.org

Public Comments Unrelated to Agenda Items

Report of Township Board Representative to the Planning Commission

Report of Planning Commission Representative to the Zoning Board of Appeals

Zoning Administrator Report

Report on Hayes Township Master Plan Advisory

New Business

Annual report to Board of Trustees- draft approval

Set/Confirm Public Hearing Dates

Set/Confirm Date of Next PC Meeting for February 21, 2023 at 7:00 pm

Public Comment

Planning Commission Comment

Adjournment

To best facilitate a hybrid meeting (in person as well as ZOOM) for the public, please adhere to the following guidelines:

In person attendance

1. Doors to the hall will open at 6:45 pm
2. Please voluntarily provide a name for the record
3. Please hold all comments until the appropriate designated public comment agenda item
4. To maintain an orderly meeting while providing opportunity for the public to be heard, Planning Commission Chairman will call names in appropriate order
5. We ask that you voluntarily state your name for the record
6. Direct all comments to the planning commission
7. Keep comments brief and to the point (3 minutes per person); deputy clerk will advise when time is up
8. Do not speak while others are speaking
9. Minutes may not be yielded to other speakers.

Via ZOOM attendance

1. Upon signing into the meeting, please voluntarily provide a name for the record
2. All ZOOM participants will be admitted from the waiting room prior to the start of the meeting
3. All ZOOM participants will remain muted until called on during the appropriate designated public comment agenda item
4. Please raise your hand to be called on during public comments
5. Direct all comments to the planning commission
6. Keep comments brief and to the point (3 minutes per person); participant will be muted at 3 minutes
7. Minutes may not be yielded to other speakers.

Note: A quorum of the Hayes Township Board members may be present at this meeting. No Hayes Township Board business will be discussed or conducted at this meeting.

Hayes Township Planning Commission
December 13th, 2022
Regular Meeting
Zoom ID 834 6034 5817

CALL TO ORDER: Chairperson Roy Griffiths called the meeting to order at 7:00 p.m.

Members present: Roy Griffiths (Chair), Steve Bulman, Derek Burnett, Marilyn Morehead, Matt Cunningham, Rex Greenslade and Ed Bajos.

Excused: Matt Cunningham

Also, present: April Hilton (Deputy Clerk/Recording Secretary).

Audience: Janet Simon, Kim Fary, Deb Narten, Jim McMahon, Diane McMahon, Ellis Boal, LuAnne Kozma, Shelly VanWart, Bob Adams, Jeff Harmon, Melvin Czechowski, and John Neych.

PLEDGE OF ALLEGIANCE TO THE FLAG: Mr. Griffiths led the Pledge of Allegiance.

REVIEW AGENDA:

Additional item:

- Presentations request for January and February Planning Commission meetings.

Mr. Bajos made a motion, supported by Ms. Morehead to approve the agenda as amended.

Yeas: Derek Burnett, Steve Bulman, Roy Griffiths, Ed Bajos, and Marilyn Morehead

Nays: none **Motion Carries**

DECLARATIONS OF CONFLICTS OF INTERESTS: None

APPROVAL OF MINUTES NOVEMBER 15TH, 2022 REGULAR MEETING

Ms. Morehead made a motion, supported by Mr. Bajos, to approve the November 15th, 2022, regular meeting minutes as corrected.

Yeas: Derek Burnett, Steve Bulman, Roy Griffiths, Ed Bajos, and Marilyn Morehead.

Nays: none **Motion Carries**

PUBLIC COMMENTS UNRELATED TO AGENDA ITEMS:

Public comments opened at 7:03 pm.

Comments Included:

- Resident is concerned about the silica dust that may be caused by gravel pits in the township and suggest the township having a Geologist investigate the gravel pits.
- Resident supports previous comment regarding the health risk that can be caused by gravel pits. Also wished everyone a Happy Holiday season.
- Resident informed the Planning Commission of research facts they had found on silica dust and the health risk that silica dust can cause residents.

Public comments closed at 7:11 pm

Hayes Township Planning Commission
December 13th, 2022
Regular Meeting
Zoom ID 834 6034 5817

REPORT OF TOWNSHIP BOARD REPRESENTATIVE TO THE PLANNING COMMISSION:

Next meeting January 9th, 2023.

REPORT OF ZONING BOARD OF APPEALS REPRESENTATIVE:

NA

ZONING ADMINISTRATOR REPORT:

Written report available at Hayes Township Hall.

NEW BUSINESS-

PRESENTATION REQUEST FOR JANUARY AND FEBRUARY PLANNING COMMISSION MEETINGS:

Lake Charlevoix Association requested to be added to the February 21, 2023 agenda for a Zoom presentation to discuss their surveying results.

Northwest Michigan Habitat for Humanity is working on a project for affordable housing and would like to discuss advancing projects in Hayes Township. This will be scheduled for the January Planning Commission regular meeting.

REVIEW OF ADVISORY GROUP ACTIVITY:

Mr. Burnett presented an oral report of the Advisory Groups activity at their last meeting.

Ms. Morehead made a motion, supported by Mr. Bajos to adopt resolution 121322.

RESOLUTION

Hayes Township, Charlevoix County, Michigan

Appointment of an Advisory Committee

WHEREAS, the Hayes Township Board of Trustees and the Hayes Township Planning Commission have determined that the Hayes Township Master Plan, adopted by the Planning Commission on January 24, 2020, and the Hayes Township Board on February 10, 2020 needs to be reviewed; and

WHEREAS, both entities have determined that issues being expressed by the community should be taken into account; specifically, the existing and future land use maps and classifications; and

WHEREAS, both entities have determined that would be in the best interest of the Township to form an Advisory Committee pursuant to MCL 125.3817 (2) to perform the review and render their recommendations for revisions to the Hayes Township Planning Commission.

Hayes Township Planning Commission
December 13th, 2022
Regular Meeting
Zoom ID 834 6034 5817

NOW THEREFORE BE IT RESOLVED that the following community members will be appointed to the Master Plan Advisory Committee for a term that will last until December 31, 2023 or the submittal of their recommendations to the Hayes Township Planning Commission whichever comes first.

Kim Fary

C.T. Martin

Jenni Silva

Mark Snyder

Jim Rudolph

BE IT FURTHER RESOLVED that two members of the Hayes Township Planning Commission be available to serve as resources to the Advisory Committee who shall include Marilyn Morehead and Derek Burnett.

BE IT FURTHER RESOLVED that the Advisory Committee has agreed to serve as volunteers, representing the best interests of the Township and without compensation.

Yeas: Derek Burnett, Steve Bulman, Roy Griffiths, Ed Bajos, and Marilyn Morehead.

Nays: none **Motion Carries**

ANNUAL ORGANIZATIONAL MEETING:

APPROVAL OF PROPOSED 2023 MEETING DATES:

Mr. Bajos made a motion, supported by Ms. Morehead to approve the 2023 proposed Planning Commission meeting dates.

Yeas: Derek Burnett, Steve Bulman, Roy Griffiths, Ed Bajos, and Marilyn Morehead.

Nays: none **Motion Carries**

ELECTION OF PLANNING COMMISSION OFFICERS:

Mr. Bajos made a motion, supported by Mr. Bulman, to open nominations for chair.

Yeas: Derek Burnett, Steve Bulman, Ed Bajos and Marilyn Morehead.

Recused: Roy Griffiths

Nays: none **Motion Carries**

Mr. Bajos nominated Roy Griffiths for Chair of Planning Commission.

Mr. Bajos made a motion, supported by Ms. Morehead to nominate Roy Griffiths to the Chair of the Planning Commission.

Yeas: Derek Burnett, Steve Bulman, Marilyn Morehead, and Ed Bajos.

Recused: Roy Griffiths

Nays: none **Motion Carries**

Hayes Township Planning Commission
December 13th, 2022
Regular Meeting
Zoom ID 834 6034 5817

Mr. Bajos made a motion, supported by Mr. Bulman, to close nominations for chair.

Yeas: Derek Burnett, Steve Bulman, Marilyn Morehead, and Ed Bajos.

Recused: Roy Griffiths

Nays: none **Motion Carries**

Mr. Bajos made a motion, supported by Ms. Morehead, to open nominations for Vice-Chair secretary.

Yeas: Roy Griffiths, Steve Bulman, Ed Bajos and Marilyn Morehead.

Recused: Derek Burnett

Nays: none **Motion Carries**

Mr. Bajos made a motion, supported by Ms. Morehead to nominate Derek Burnett for Vice-Chair Secretary.

Yeas: Roy Griffiths, Steve Bulman, Ed Bajos and Marilyn Morehead.

Recused: Derek Burnett

Nays: none **Motion Carries**

Mr. Bajos made a motion, supported by Ms. Morehead to close nominations for Vice-Chair secretary.

Yeas: Roy Griffiths, Steve Bulman, Ed Bajos, and Marilyn Morehead.

Recused: Derek Burnett

Nays: none **Motion Carries**

Mr. Griffiths made a motion, supported by Mr. Bajos to open nominations for Planning Commission representative to the ZBA.

Yeas: Roy Griffiths, Steve Bulman, Marilyn Morehead, Ed Bajos, and Derek Burnett

Nays: none **Motion Carries**

Mr. Griffiths made a motion, supported by Mr. Bajos to nominate Rex Greenslade for the Township Planning Commission Representative to the ZBA.

Yeas: Roy Griffiths, Steve Bulman, Marilyn Morehead, Ed Bajos, and Derek Burnett

Nays: none **Motion Carries**

Mr. Griffiths made a motion, supported by Mr. Bajos to close nominations for the Planning Commission Representative to the ZBA.

Yeas: Roy Griffiths, Steve Bulman, Marilyn Morehead, Ed Bajos, and Derek Burnett

Nays: none **Motion Carries**

SET/CONFIRM PUBLIC HEARING DATES:

None

Hayes Township Planning Commission
December 13th, 2022
Regular Meeting
Zoom ID 834 6034 5817

SET/CONFIRM DATE OF NEXT PLANNING COMMISSION MEETING:

Next Planning Commission meeting will take place on January 17th, 2023, at 7:00 pm.

PUBLIC COMMENT: Public comments open 7:24 pm.

Comments included:

- Resident asked Chair Roy Griffitts if he has a suggestion of how to best distribute a film soon coming available to the Townships, regarding gravel pit information.
- Resident is disappointed with some of the Park and Rec decisions for the Township parks.
- Resident is disappointed to see Roy Griffitts nominated as Chair of the Planning Commission.
- Resident informed the Planning Commission of the rezone they believe has been rezoned in error without property owner approval. Would like to know who made the error, and if a public hearing is necessary.
- Resident is disappointed with Roy Griffitts as the Chair and disappointed with the rest of the Planning Commission supporting Roy Griffitts as the chair.

Public comments closed 7:43pm

PLANNING COMMISSION COMMENT:

Mr. Burnett and Mr. Griffitts clarified the Public Hearing process.

ADJOURNMENT: Mr. Bajos made a motion, supported by Mr. Bulman, to adjourn the meeting at 7:45 pm.

Yeas: Derek Burnett, Steve Bulman, Roy Griffitts, Marilyn Morehead, and Ed Bajos.

Nays: none **Motion Carries**

Respectfully Submitted by:
April Hilton
Deputy Clerk/Recording Secretary



Fwd: Affordable Housing in Northern Michigan

1 message

Hayes supervisor <supervisorhayestownshipmi@gmail.com>
To: Kristin Baranski <clerk@hayestownshipmi.gov>

Fri, Dec 9, 2022 at 8:33 PM

Sent from my iPhone

Begin forwarded message:

From: Kyle Ulrich <kyle@northwestmihabitat.org>
Date: December 9, 2022 at 1:16:31 PM EST
To: supervisor@hayestownshipmi.gov
Subject: Affordable Housing in Northern Michigan

Good Afternoon Ron!

My name is Kyle Ulrich and I'm the Senior Development Officer here at Northwest Michigan Habitat for Humanity, and I'm also a Springvale Township Trustee here in Emmet County. As you may know, quality affordable housing is a major issue in our region. Current data reveals that 92% of our area's workforce was found to spend 45% or greater of their income on housing and transportation costs, many of those respondents are spending well over 50% of their income on housing alone! This outsized cost burden coupled with lack of affordable housing stock is squeezing our working middle class families out of the area. This is causing general instability for local businesses, healthcare, our schools, and the overall economy as a result.

I'm reaching out because I would like to see if there is any chance for our organization to meet with the board and discuss the potential availability of land owned by Hayes Township that might be a good fit for building affordable homes. I have met personally with a number of supporters from Hayes Township that are very interested in us advancing projects in your area.

If you have some time and would like to discuss, please feel free to give me a call.

Thank you,

Kyle Ulrich
Senior Development Officer
Northwest Michigan Habitat for Humanity
[1840 M-119, Unit 1, Petoskey, MI 49770](mailto:1840-M-119,Unit1,Petoskey,MI49770)
Cell: (906) 630-1564

"Home is where our story begins..."

www.northwestmihabitat.org
www.facebook.com/northwestmichiganhabitatforhumanity

2022 Hayes Township Planning Commission Annual Report

2022, was a year of recovery from the Covid limitations and accommodations. We continued to work on updating the Zoning Ordinance as a whole. The PC met a total of 11 times in a combination of regular, special and training sessions.

The work on the update of the Zoning Ordinance began well but as several important issues were the subject of the Zoning Board of Appeals hearings, progress slowed to await the outcome of those hearings. The PC has largely completed the initial draft of several chapters of the Ordinance and has distributed it to the members for a comprehensive review and edit suggestions. There are still a couple of sections to finish updating. We believe we will finish our update by mid 2023 and send it back to the consultant for further refinement before coming back to the PC and then be issued for public feedback.

In addition to working on the ordinance we conducted the regular business of the PC including holding public hearings on rezoning's, special use permits, and preliminary project discussions. We had guest speakers who advised us on issues around affordable housing and how the township might assist in the development of housing. The issue of the future land use map in the Master Plan was raised and an advisory group consisting of community members, Planning consultant and support from PC members was appointed to provide recommendations to the PC on the issue.

Plans for 2023 include finalizing the Zoning Ordinance update and further work in the effort to increase housing options in our community.



clerk hayestownshipmi <clerkhayestownshipmi@gmail.com>

Rieth-Riley Bay Shore Pit Greenbelt2 messages

Jim Pemberton <jpemberton@rieth-riley.com>

Mon, Jan 9, 2023 at 2:39 PM

To: Hayes supervisor <supervisorhayestownshipmi@gmail.com>, "clerk@hayestownshipmi.gov" <clerk@hayestownshipmi.gov>

Cc: Keegan Brennan <kbrennan@rieth-riley.com>, Paul Glotzhober <pglotzhober@rieth-riley.com>, Brad Shearer <BSHEARER@rieth-riley.com>

Greetings Ron:

Thank you for bringing this matter to our attention. Rieth-Riley does not have any record of a greenbelt agreement between itself and any local subdivision or HOA relative to its "Bay Shore" property.

Rieth-Riley remains committed to following all township and county zoning ordinances and requirements, including the required set back of all mining operations from each neighboring property. To that end, Rieth-Riley will not disturb the existing ground and fauna within the setback.

Regards,

Jim

James S. Pemberton, P.E.

Area Manager

PETOSKEY AREA OFFICE**Rieth-Riley Construction Co., Inc.***A 100% Employee-Owned Company***06795 US-31 North**

Charlevoix, MI 49720

phone 231.439.5757

fax 231.347.8862



*Northern Michigan Shores Property Owners Association
6865 9 Mile Pointe Drive
Charlevoix, MI 49720*

January 10, 2023

Hayes Township Master Plan Focus Group Hayes Township Planning Commission Hayes
Township Board of Trustees
Hayes Township Hall
9195 Major Douglas Sloan Road
Charlevoix, MI 49720

Dear Focus Group, Planning Commission, and Board of Trustee Members,

As the Hayes Township Master Plan Focus Group is meeting soon, the Board of Directors of the Northern Michigan Shores Property Owners Association is writing this letter to express our concerns regarding the Hayes Township Master Plan.

We are mostly concerned about the Rieth-Riley property which is adjacent to Michigan Shores. The Rieth-Riley property contains a large gravel mine, and a forested section (known as a green belt) which is directly behind Michigan Shores. Bay Shore is also in Focus Area 1, and also faces many of the same issues with a gravel pit. How these properties will be zoned in the near future will affect our property values and lives.

Areas of concern:

- 1) **Green belt, owned by Rieth-Riley**, is mostly on a high bluff up-gradient (directly above) to Michigan Shores. This bluff is composed of gravel and sand. In Article VII, section 15, of the current zoning ordinance, the setback is normally 50 feet for mining. For mining near residential areas, the setback is 100 feet (Article VII, section 15.C.1). For Industrial purposes, the normal setback is 25 feet (Article IV, section 4.13, Schedule of Regulations). In any of these cases, the setbacks are not sufficient when near residential areas, especially for Michigan Shores Subdivision. In addition, the Rieth/Riley property (green belt) is up-gradient from (about 30 Ft higher than) the Michigan Shores owners property. Therefore, any development on the green belt can adversely affect Michigan Shores. There must be an effective "step-down transition zoning" (Refer to Pangea Environmental, LLC. Letter to Advisory Group, regarding: Comments to the Master Plan Changes in the Bayshore Community on Oct. 17, 2022).
- 2) **The Rieth-Riley gravel pit area is mostly a large hole**, and any development would require filling the hole. In addition, We do not know what type of contamination may have occurred during mining.

Further concerns with this area:

- a) If hole is filled, what type of material will be used?
- b) Past contaminations in pit, both documented and undocumented.
- c) Underground rock formations and layers
- d) Possible fractured limestone rock layers: natural or occurring during mining
- e) Fractures in the aquifers from above and below, may result in clean water issues

- f) Need knowledge of aquifer, that supplies water to Michigan shores, as to whether aquifer is confined or unconfined.
- g) Soil compositions
- h) Locations of residential areas, well and septic systems
- i) Impact of new septic systems on existing homes in the near vicinities.
- j) Determine of other unknown factors

3) **Air quality in the area is of great concern** for all open gravel pits. This is because these gravel pits contain sand, and the most common constituent is silica usually in the form of quartz. Silica dust is created by mining, grinding or drilling quartz. Airborne silica is a health hazard implicated in human carcinogen and also silicosis.

The Michigan Department of Health and Human Services (MDHHS) is conducting an environmental health study around a sand and gravel mine in southern Michigan due to the apparent cluster of illnesses around the mine.

Air quality in the area has already been degraded for years by airborne silica dust coming from the open areas of the mines.

Silica is a human carcinogen and also causes silicosis. Silicosis symptoms take years or decades to appear. Industrial operations and the potential associated airborne emissions can add an additional burden on the health of the residents nearby. Diesel exhaust particulate matter is another issue that is attracting attention, as it is related to human health. This material contains heavy metals and unburned, carcinogenic hydrocarbons.

4) **Environmentally acceptable** low-risk future zoning applications for these old gravel pit areas must be explored and investigated:

- What scientific research has already been performed by governmental and private organizations regarding future uses of old gravel pit mined areas?
- What are known and proven low-risk zoning classifications for old gravel pit areas?
- What can Hayes Township benefit from the research?

What can Hayes Township do to promote the safe use of this old gravel area?

Zoning classifications **must be assigned only after careful analysis by an independent, certified geologist and hydrologist.** Use of modern science, and not suppositions, must be employed by the Focus Group and Planning Commission before zoning classifications are made.

Responsibility

The location of Industrial parcels next to residential areas (Michigan Shores and Bay Shores) is just poor land use planning. It is much more appropriate to have a transition to industrial land use with a buffer of less intense uses, such as commercial or even recreational land between industrial land uses and residential.

In order to protect the health of residents and property values of Michigan Shores residents an effective green belt should be maintained between the Michigan Shores Community and the

Rieth-Riley aggregate operation. This would include parcel **15-007-102-001-00**. Creating a conservation easement as a protective measure should be considered.

It is important to know that the value of property in Michigan Shores far exceeds the property value of the Rieth-Riley property, and that the property taxes paid by Michigan Shores Residents is much higher than any property taxes paid by Rieth-Riley. Any development in that area that adversely affects the value of properties in Michigan Shores will directly decrease property taxes paid to Hayes Township.

Master Planning Advisory committee, Hayes Planning Commission, and Hayes Board of Trustees must realize that they are responsible for any adverse affects to this local community because of their decisions on how this area will be zoned.

Thank you for your consideration of our concerns.

Sincerely,

Nancy Simon, President, lifecoachsimon@gmail.com

Ruth Augustine, Vice-President, raaugustine@gmail.com

Sarah Wolf, Treasurer, nmspoa@gmail.com

Karen Wooster Secretary

Melvin Czechowski, Director, mhczechow@aol.com



clerk hayestownshipmi <clerkhayestownshipmi@gmail.com>

Advisory Committee & Planning Commission

1 message

Bob Brill <bobbbrill74@gmail.com>

Mon, Jan 9, 2023 at 6:30 PM

To: clerk@hayestownshipmi.gov

To whom it may concern,

My name is Bob Brill and I live at [06468 US Hwy 31 N](#), just behind the Subaru Dealership. My property borders slightly on the gravel pit on the north side of Pincherry Rd.

I am writing to voice my opinions on the issue of zoning and future use planning. I have a very difficult time making it to meetings as my Wednesdays tend to be full.

I fully understand that the Zoning board cannot make changes without a request from the property owner, and that any such request would be met with a public discussion. I also understand that the future use map is not indicative of planned changes.

My opinion, as a bordering property owner to existing Industrial zoning and zoning potential future planned as expanded Industrial, is that while the current Industrial use has not been terribly detrimental, expansion of Industrial Zoning bordering so many residential properties is not what the township needs. I understand that grouping any future industrial zones together with existing ones makes a certain sense, however I do not see the need to allow or court the possibility of more industrial zoning in our area. Questions of health and environmental safety, property values, and overall aesthetics become untenable creating an unstable environment for those of us who live so close to the affected area. Just allowing for the potential of zoning changes to Industrial, keeps us on edge, worried of a future land use that could degrade our quality of life for no real benefit to anyone.

Thank you for your time, and I hope your decisions are weighted with the concerns of those most closely affected.

Thank you,

Bob Brill

PS - I was recently added to the Veteran Memorial at the Township Hall and I greatly appreciate that.



clerk hayestownshipmi <clerkhayestownshipmi@gmail.com>

The Gravel Pits at Michigan Shores and Bay Shore # 6

1 message

Jim McMahon <jim_mcmahon_iii@yahoo.com>
To: Kristin Baranski <clerk@hayestownshipmi.gov>

Sat, Jan 7, 2023 at 12:41 PM

Hi Kristin,

Please distribute this email to the Board of Trustees, the Planning Commission, the Advisory Group, and the Zoning Administrator before their respective next meetings.

Thank you very much.

Jim McMahon
phone: 231-347-9829

Below is an email that was sent out today to the entire Michigan Shores Association membership. This email talks about some of the many critical issues surrounding the use of the two gravel pits near Bay Shore and Michigan Shores. Please read this entire email because it describes many of the issues involved with your decision making. As you well know, there are many, many people who are very concerned about the next steps for the safety of our drinking water, the quality of our air, our property values, and how we will live our lives.

Please consider all of the issues described here. Thank you.

Hello Michigan Shores neighbors,

The headline: The Hayes Township Master Plan Advisory Group is meeting on Wednesday, January 11, at 6:00 pm to discuss and decide on their recommendation for the future zoning of the two old Rieth-Riley gravel pits adjacent to Michigan Shores and Bay Shore. Our property values, health, and lives will be affected by their decisions.

Is this important to you? Be there at 6:00 pm at the Hayes Township Hall on Wednesday, January 11. Please note the earlier start time of 6:00 pm. If you cannot be there in person, then participate on Zoom at <https://www.hayestownshipmi.gov>

How good are you at answering the following questions?

1. How is all of the Rieth-Riley property zoned, including the so-called greenbelt parcel that runs the entire length and adjacent to Michigan Shores? **Answer:** All Rieth-Riley property north of US-31 is zoned Industrial.
2. Where is the Rieth-Riley "industrial and mining" property located within Michigan Shores subdivision? **Answer:** There are three locations where Rieth-Riley has road frontage within Michigan Shores:
 - a. On Michigan Shores Drive at the 1st turn near the old, hidden swing set, there is 233 feet of road frontage. This road frontage provides access to the many acres behind lots 97-109.
 - b. At the Nine Mile Point Drive road-end circular turn-around, there is 634 feet of road frontage.

c. At the Nine Mile Point Drive road-end, there is at least 58-60 feet of additional road frontage, enough to open up Nine Mile Point Drive to be a through-road to the large parcels to the east and Bay Shore North subdivision along the lake.

Are you surprised that Rieth-Riley actually owns nearly 1,000 feet of road-frontage property within Michigan Shores subdivision?

3. If all of the Rieth-Riley property abutting the entire southern edge of Michigan Shores was turned into Industrial or Residential uses, what would you see? **Answer:** No trees. That's correct, there are **29 acres of forest owned by Rieth-Riley along the entire southern edge of Michigan Shores** subdivision that would disappear. That forested area would be gone!!! How would that look? Except for lots 53-59, all of the lots along the exterior, southern edges of Nine Mile Point Drive and Michigan Shores Drive are only 150 feet deep.

That's the stark reality: all of the trees would be gone. How would that look? How would our property values, erosion, and health be affected?

Again, can you paint a vivid picture in your mind of most of the trees gone in the 29 acres along the entire southern edge of Michigan Shores?

4. How close can Industrial applications be to Michigan Shores residential properties?

Answer: Front and rear property setbacks are 50 feet. Side yard setbacks are just 25 feet.

5. How close can gravel mining and rock crushing activities be to the adjacent properties in Michigan Shores? **Answer:** For non-residential properties, 50 feet, and for residential properties, 100 feet. That's not much separation.

6. Does Rieth-Riley own the entire ridge and bluff on the southern edge of Michigan Shores?

Answer: Yes. All of the ridge and bluff are owned by Rieth-Riley and zoned Industrial.

7. How does the ground water flow between the Rieth-Riley operations and Lake Michigan?

Answer: The ground water flows through our Michigan Shores properties on its way to Lake Michigan. We drink that same water from our wells.

8. Is your personal well susceptible to possible contamination from activities over the ridge coming from Rieth-Riley? **Answer:** Yes. Water flows underground from the upland toward the lake from Bay Shore and beyond. We are tied to the health of Bay Shore! **Let's repeat that: Water flows underground from the upland toward the lake from Bay Shore and beyond. We are tied to the health of Bay Shore and Rieth-Riley property!**

9. Have you ever tested your water for chemical contaminants? Will you test your water for contaminants when Industrial or large Residential uses are implemented just over the ridge or within Michigan Shores on Rieth-Riley property? If you or your grandchildren cannot drink your ground water, what is your recourse? How will that go? Can contamination issues ever be mitigated? Once there is an underground water pathway for contamination, can it ever be corrected? **Answer:** Who knows?

10. How long has the gravel mining and rock crushing operations over the ridge been in operation? **Answer:** Certainly, more than 55 years, perhaps longer. Today, there is a big, wide, deep hole in the gravel pit, along with other land that has been severely disturbed over many years in the gravel pit area adjacent to Michigan Shores.

11. Do you know what silica is and is it harmful? **Answer:** Gravel pits contain sand and the most common constituent is silica, usually in the form of quartz. Silica dust is created by mining,

grinding, or drilling quartz. Airborne silica is a severe health hazard. Silica is a human carcinogen and can cause silicosis. Silicosis symptoms take years and decades to appear in people.

12. How far can airborne silica dust travel? **Answer:** For miles, depending on its size and wind velocity.

13. Is diesel exhaust particulate from heavy equipment used in Industrial and mining operations a concern? **Answer:** Diesel exhaust contains heavy metals and unburned, carcinogenic hydrocarbons.

How did you do on these questions? Do you have any concerns from considering these questions?

The Rieth-Riley gravel-pit just over the ridge from Michigan Shores, just a few feet from us, is a **huge unknown**. The same is true for the old, gravel mining operation adjacent to the community of Bay Shore.

Here are just a few of the many questions and unknowns that need answering:

1. If the huge, gravel pit hole is filled for any future developmental purpose, what type of material will be used and is there a possibility that the fill will be contaminated?
2. What are the past contaminations in the entire gravel pit operation, both documented and undocumented?
3. What and where are the underground rock formations and layers?
4. Are there fractured limestone rock layers (of bedrock), both natural and un-natural occurring during past mining activities?
5. Are there fractures in the aquifers from above and below, resulting in clean water issues?
6. What is the aquifer knowledge of water flowing through Michigan Shores, as to whether the aquifer is confined or unconfined?
7. What are the soil compositions?
8. Where are the detailed locations of residential areas, wells, and septic systems?
9. What are the impacts of new septic systems and wells on existing homes in the nearby vicinities?
10. What other unknowns are there? How dangerous are these unknowns?

At issue: This entire subject of what can be done with the old, gravel pits at Michigan Shores and Bay Shore is very complicated and health concerning. This is more complex than what meets the eye at first glance. Just because property has been zoned Industrial in the past, because of unknown factors, there is no reason to continue with that zoning classification because it may be expedient to do so.

There are people's health and property values at stake here. For the Future Land Use Map, we propose to zone both gravel pits near Michigan Shores and Bay Shore as **Conservation Reserve (CR)**. There are too many variables that can never be known for sure after nearly 60 years of

heavy-duty mining and destruction of the natural environment. Some other communities have resorted to reclaiming the property and turning it into recreational use.

What is at stake here is the safety of our drinking water, the quality of our air, our property values, and how we will live our lives. **Ultimately, Hayes Township will be responsible for the zoning decisions it makes. We will have to live with those decisions.** Please show up for the 6:00 pm meeting on Wednesday, January 11, at the township hall. The future of how these two old gravel pits are re-used is at stake. Zoom participation at the meeting is available on the Hayes Township website.

Thank you.

Jim McMahon
jim_mcmahon_iii@yahoo.com

Mel Czechowski
mhczechow@aol.com



Pangea Environmental, LLC

Mike Wilczynski
Certified Professional Geologist
Pangea52@yahoo.com
248.318.732

January 10, 2023

John Iacoangeli
Beckett and Raeder, Inc.
Petoskey, MI

RE: Preliminary Hydrogeological Assessment for Bayshore and Michigan Shores Communities

John, as we discussed in our Zoom meeting, I am submitting this preliminary hydrogeological assessment of the area around the Bay Shore and Michigan Shores Communities. I have reviewed information from websites maintained by the Michigan Department of Environment, Great Lakes and Energy (EGLE) that includes Water Well Viewer, Environmental Mapper, Water Withdrawal Assessment Tool, Wetland Viewer and Geowebface. I also reviewed historical aerial photographs and US Geological Survey (USGS) topographic maps and the geological map of Michigan by Farrand and Bell (1982).

The surficial, or surface natural material consists of glacial deposits made up of mostly coarse sand and gravel with some clay layers. This overlies the bedrock of the Traverse Group. Based upon the residential water well records, the groundwater is shallow and occurs in much of the area as an unconfined aquifer, more on this later.

Areas in an upgradient direction of the groundwater flow in both the Bay Shore and Michigan Shores areas were mined which removed much of this material making the area even more sensitive to contamination from the surface. The unsaturated material above the water table plays a major role in protecting the quality of groundwater in an aquifer.

Figure 1. Presents the wellhead protection zones in the area. Based upon the shape and location of the extraction wells, these indicate the groundwater flow is mostly toward Lake Michigan. So, any impacts to the groundwater quality will flow toward Lake Michigan. This supports our earlier assertion regarding the groundwater flow direction.



Pangea Environmental, LLC

Mike Wilczynski
Certified Professional Geologist
Pangea52@yahoo.com
248.318.4732

As you know, these wellhead protection areas are approximate, just due to the nature of the data used.

The figure also presents the locations of some of the residential water wells (blue dots). Older wells do not appear in EGLE Water Well Viewer.

Figure 2 is a map that presents examples of selected water well records we reviewed. This is not to be considered a complete hydrogeological study, but rather preliminary assessment of the sensitivity of the groundwater to contamination from surface uses.

Well 1 is in Bay Shore and encountered groundwater at 32 ft below ground surface (bgs). The groundwater occurs in an unconfined aquifer. This is an aquifer that does not have a protective layer of clay over it to help keep out contamination from the surface. These are the most sensitive to contamination. The aquifer is described as gravel, which can be highly permeable and can conduct groundwater and contaminants relatively rapidly compared to other geological material.

Well 2 is west of well 1 and included to demonstrate the consistency of the geology and depth to groundwater with well 1.

Groundwater was present at approximately 1 ft bgs in well 3 and only 4 ft bgs in well 4, both along the Lake Michigan shoreline in Michigan Shores. The groundwater appears to be in an unconfined aquifer.

Wells 5 and 6 are also in Michigan Shores but further away from the shoreline and higher in elevation. The water table was less than 30 ft bgs at the time the wells were installed according to the well records.

Wells 7 and 8 are deeper and appear to be in the bedrock aquifer. The well records indicate impermeable layers above the water intake for the wells, however, the similarities in groundwater elevations indicate some connection between the shallow groundwater and that deeper in the aquifer system.

Figure 3 indicates what appears to be the water table breaching the surface in the former mine.



Pangea Environmental, LLC

Mike Wilczynski
Certified Professional Geologist
Pangea52@yahoo.com
248.318.4732

I have also attached information regarding silica dust and how far it can travel. Silica is quartz which makes up most of the sand in a sand and gravel mine. The table allows the distance to be estimated based upon wind velocity and particle size. The smallest

size particles are the most hazardous because they get deeper into the lungs. Silicosis is irreversible and silica dust is also linked to lung cancer. In Jackson County the Michigan Department of Health and Human Services (MDHHS) is conducting a study around a sand and gravel mine because of the apparent cluster of illnesses around the mine,

The conclusions based upon the above information, are that the area's groundwater is highly sensitive to contamination and is the sole source of drinking water in the area.

The occurrence of groundwater within 1 ft of the surface and the potential surface breaching of the water table in the former mine make this an area where care must be taken in designating land uses. It appears even the deeper wells in the bedrock are hydraulically connected to the shallow groundwater to some degree.

It is our opinion further hydrogeological and environmental studies would only confirm our conclusions presented in this report. This is not an area suited for industrial operations.

Commercial uses that use large quantities of hazardous material should be allowed only after careful consideration. Our past reports present other issues, such as the dangers of silica dust, the location of a salt storage facility or other industrial operation, the sensitivity of the Bay Shore area to ground vibrations and environmental justice concerns.

BTW, Figure 4 is from EGLE Water Well Viewer and indicates there are 2 open releases from underground storage tanks (UST) along US 31 and Townline Rd. This is most likely contamination from the release of petroleum hydrocarbons, such as gasoline or diesel. Occasionally, these maps are not current and these may be closed. These are listed as closed on the map produced from EGLE Environmental Mapper. This discrepancy should be resolved.



Pangea Environmental, LLC

Mike Wilczynski
Certified Professional Geologist
Pangea52@yahoo.com
248.318.4732

EGLE Remediation and Redevelopment Div (RRD) would know for sure. The Part 213 Program that deals with leaking USTs is an audit program and the closures do need to be checked because the site may not have been reviewed by EGLE RRD staff and it closed under operation of law. I found many issues with closure reports under 213 when I worked for the Michigan Department of Environmental Quality (DEQ), now EGLE.

Please let me know if you have questions or comments. I'm working for free, so no one is getting charged for my time.

Take care! I enjoyed our conversation the other day. Thanks for taking the time to speak with me.

Pangea Environmental, LLC
Mike Wilczynski
Certified Professional Geologist-Emeritus
Hydrogeology and Mining

cc: Ron VanZee

Figure 1



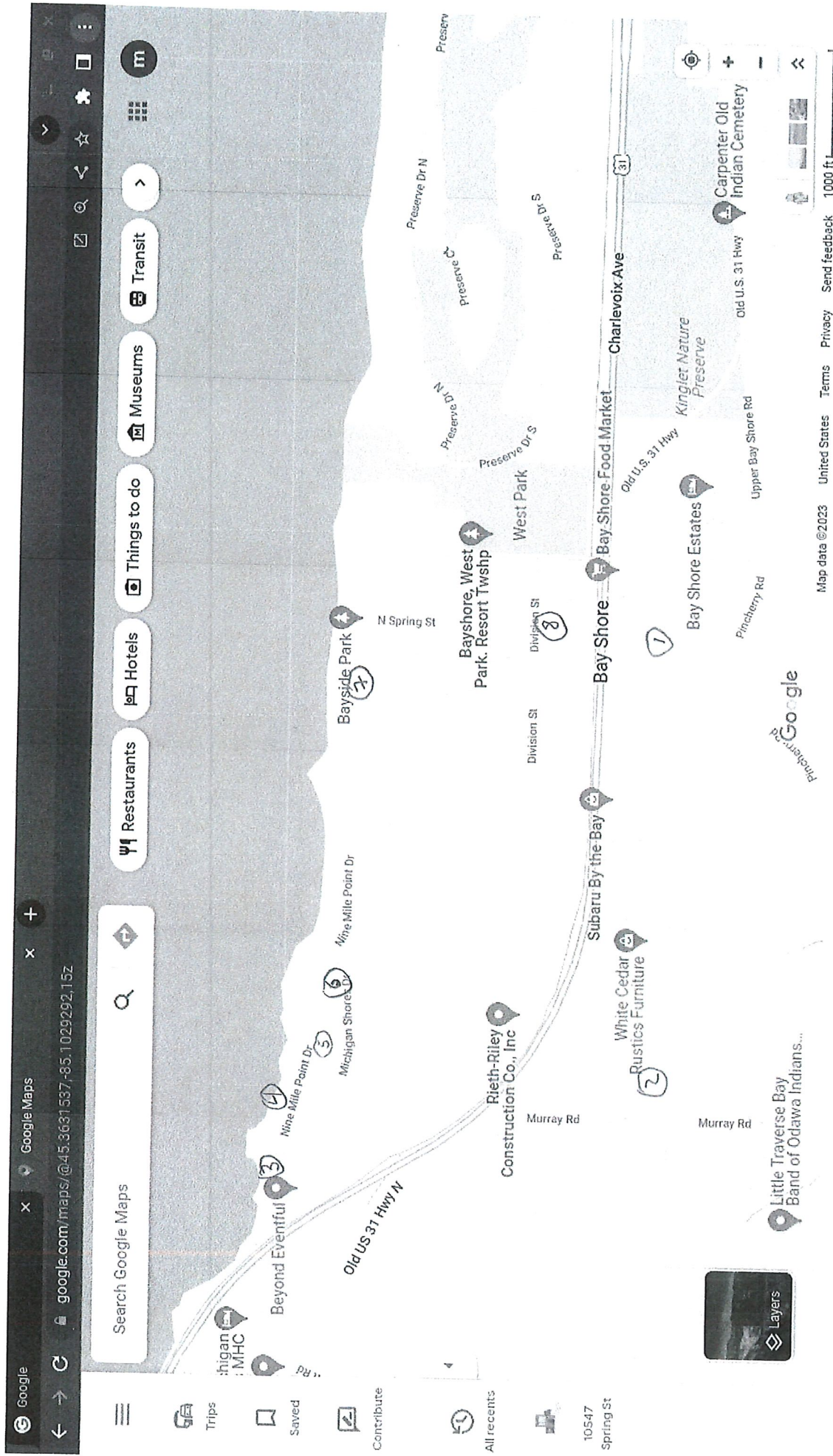


Figure 2

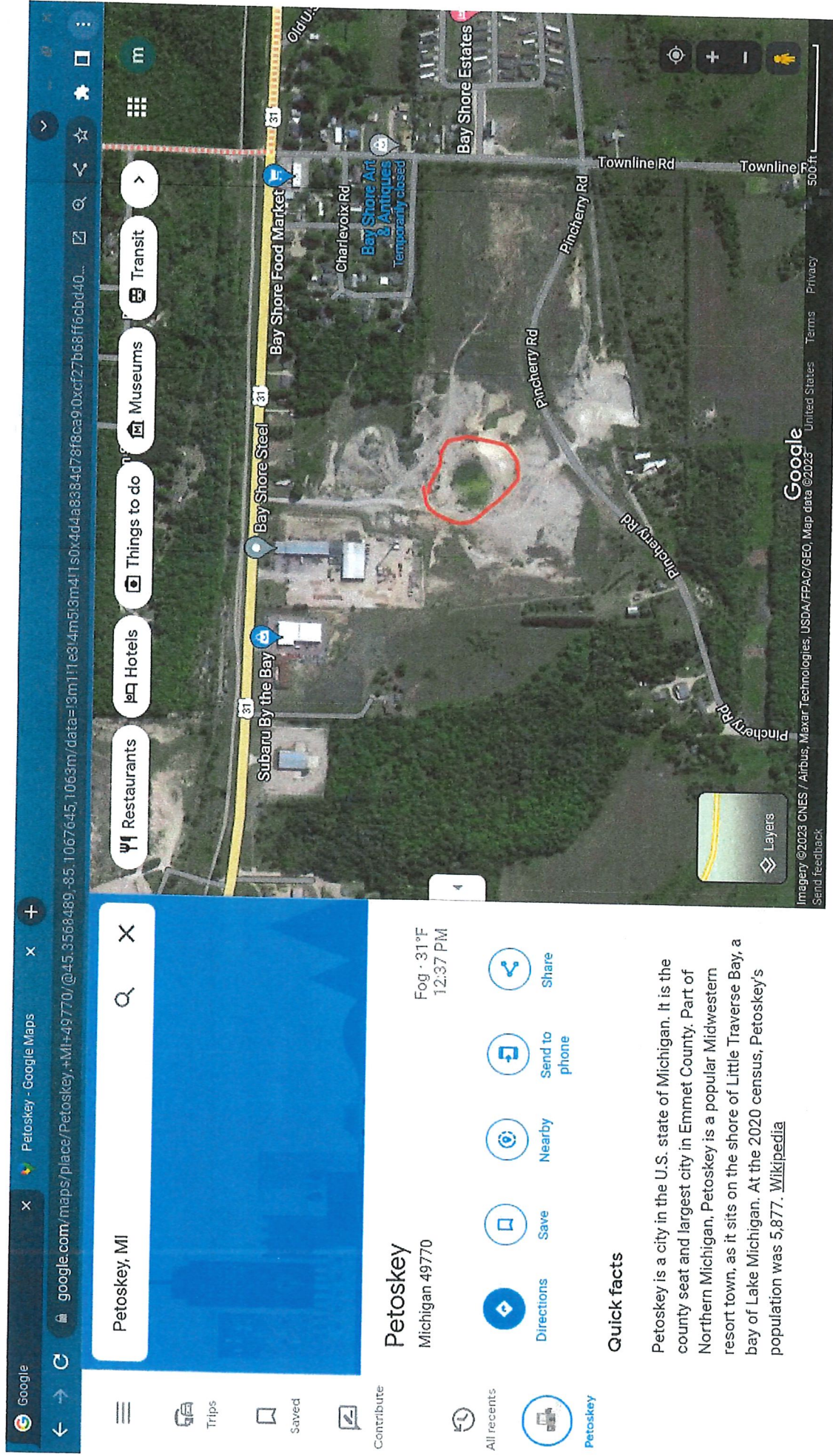
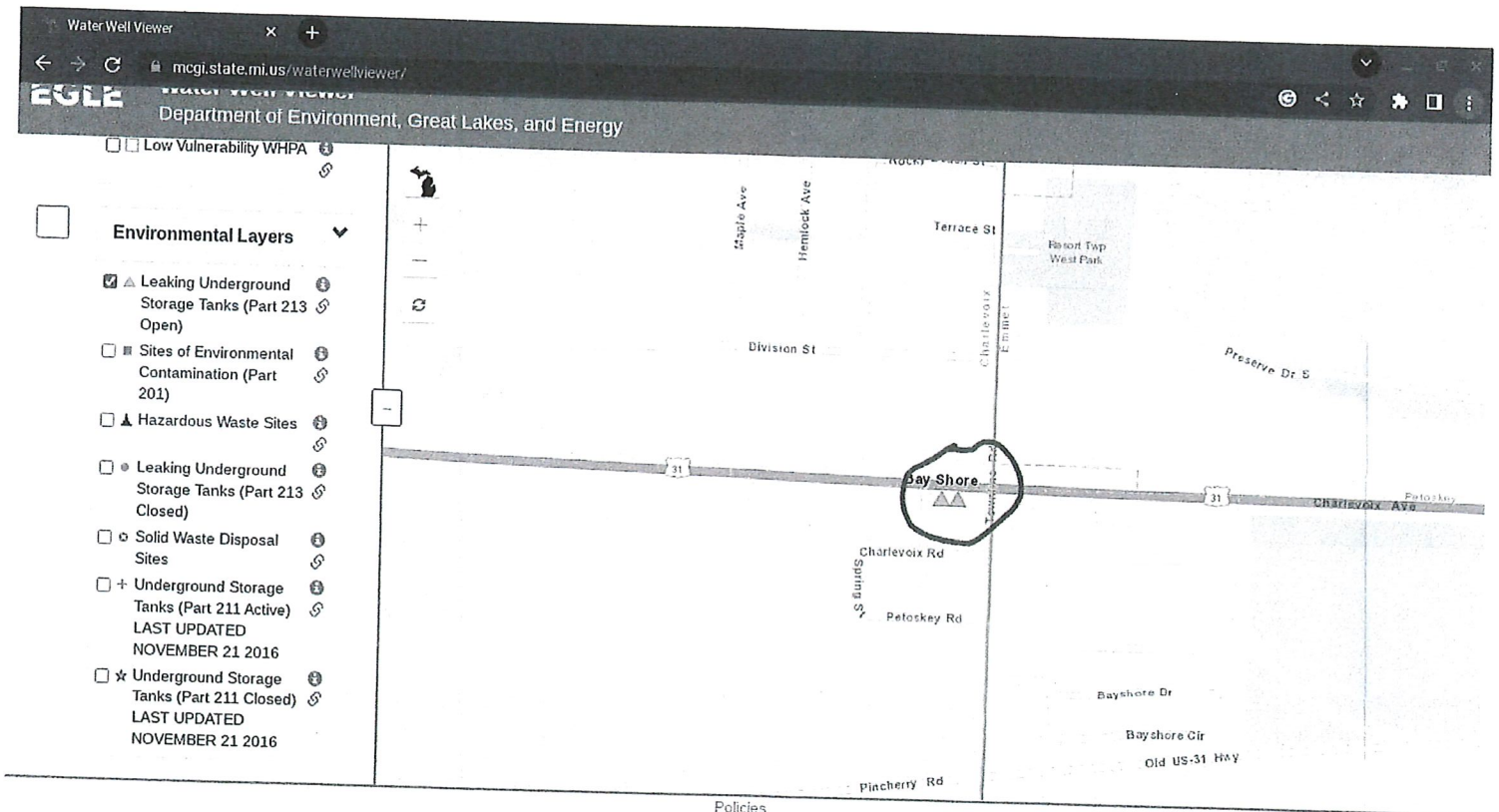


Figure 3

Figure 4



Respiratory and Allergic Immune Response Impacts of Gravel Pit / Quarry Operations on Adjacent Land / Properties

Calculations for 10 µm Particles:

Dust of this size is the median inhalable diameter specified by the EPA. "The EPA describes inhalable dust as that size fraction of dust which enters the body, but is trapped in the nose, throat, and upper respiratory tract." The terminal velocity of this size of particle is calculated to be 7.53E-03 m/s using Stokes Law for Fluid-Particle Forces, in the conditions specified previously.

It will therefore take 664 seconds for these particles to fall from a height of 5 meters (16.4 feet).

<u>Wind Speed</u>	<u>Travel Distance</u>
5 km/h (3.1 mph)	0.9 km (.55 mile)
10____(6.2 mph)	1.8 (1.1 miles)
20____(12.4 mph)	3.7 (2.3 miles)
40____(24.8 mph)	7.4 (4.6 miles)
60____(37.3 mph)	11.1 (6.9 miles)
80____(49.7 mph)	14.8 (9.2 miles)

Calculations for 5 µm Particles:

Dust of this size falls within the respirable dust range as specified by the EPA. Respirable dust refers to those dust particles that are small enough to penetrate the nose and upper respiratory system and deep into the lungs. Particles that penetrate deep into the respiratory system are generally beyond the body's natural clearance mechanisms of cilia and mucous and are more likely to be retained

The terminal velocity of this size of particle is calculated to be 1.91E-03 m/s using Stokes Law for Fluid-Particle Forces, in the conditions specified previously.

It will therefore take 2,612 seconds for these particles to fall from a height of 5 meters (16.4 feet).

<u>Wind Speed</u>	<u>Travel Distance</u>
5 km/h (3.1 mph)	3.6 km (2.2 miles)
10____(6.2 mph)	7.3 (4.5 miles)
20____(12.4 mph)	14.5 (9 miles)
40____(24.8 mph)	29.0 (18 miles)
60____(37.3 mph)	43.5 (27 miles)
80____(49.7 mph)	58.1 (36.1 miles)

Conclusion:

Using EPA inhalable dust and Stokes Law for Fluid Particle Forces definitions and calculations, by varying the dust particulate particle size, wind speed, and release height, respirable dust can, and will, impact areas just about anywhere directionally downwind from a gravel pit's operational activities, unquestionably posing health risks and bearing an impact on adjacent properties, including to residential and school facilities areas and occupants, and particularly on sensitive and vulnerable adults, seniors, and children.

Respiratory and Allergic Immune Response Impacts of Gravel Pit / Quarry Operations on Adjacent Land / Properties

The Effect of Particles on Allergic Immune Responses

<http://toxsci.oxfordjournals.org/content/65/1/7.full> (including impacts/effects of airborne sulfur (SO₂) and silica particulates/particles)

<http://oehha.ca.gov/air/pdf/oehhaso2.pdf> (sulfur specific)

Prior to 1980, controlled exposures of human subjects to SO₂ had involved only healthy subjects. In general these studies did not find adverse respiratory effects even at concentrations of 13 ppm (Frank et al, 1962).

In 1980 and 1981, Koenig et al (1980; 1981) and Sheppard et al (1980; 1981) published the results of controlled SO₂ exposures in both adolescent and adult subjects with asthma. *The studies by Koenig and Sheppard found that people with asthma were extremely sensitive to inhaled SO₂ and therefore may be at increased risk for adverse respiratory effects in communities where SO₂ concentrations are elevated even for short periods of time.*

Small particles are the most dangerous

[2768]

Because of the size of the particle, they can penetrate the deepest part of the lungs. Larger particles are generally filtered in the nose and throat and do not cause problems, but particulate matter smaller than about 10 micrometers can settle in the bronchi and lungs and cause health problems. Similarly, particles smaller than 2.5 micrometers tend to penetrate into the gas-exchange regions of the lung, and very small particles (\leq 100 nanometers) may pass through the lungs to affect other organs. Particles smaller than 100 nanometers can pass through cell membranes and migrate into other organs, including the brain. It has been suggested that particulate matter can cause similar brain damage as that found in Alzheimer patients. Particles emitted from modern diesel engines are typically in the size range of 100 nanometers. In addition, these soot particles also carry carcinogenic components like benzopyrenes adsorbed on their surface.

Long-term exposure to fine particulate

[2769]

Pope and colleagues 2002 found that particles smaller than 2.5 micrometers leads to high plaque deposits in arteries, causing vascular inflammation and atherosclerosis. Fine particulate and sulfur oxide-related pollution were associated with all-cause, lung cancer, and cardiopulmonary mortality. The authors concluded that long-term exposure to combustion-related fine particulate air pollution is an important environmental risk factor for cardiopulmonary and lung cancer mortality. The authors stress that the legislative limits for engines are unsuitable to protect against particulate matter.

Respiratory and Allergic Immune Response Impacts of Gravel Pit / Quarry Operations on Adjacent Land / Properties

Toxicology of particulate matter

[2770]

According to Valavanides and colleagues 2008, the inflammatory injury, oxidative damage, and other biological effect are stronger for fine and ultrafine particles, such those from exhaust particles from motor vehicles because they can penetrate deeper into the airways of the respiratory tract. These particles pollute urban areas. The authors call for studies on the cytotoxic and carcinogenic mechanisms of particulate matters in the lungs. They stress the importance to understand the formation of particulate matter by internal combustion engines and other sources.

One of the single most useful reference on fugitive emissions is "Fugitive Emissions and Controls, by Hesketh and Cross, 1983, and this work focused on dust. They mention primary fugitive dust sources as being unpaved roads; mining, excavating, crushing operations; and heavy construction operations as the first, fourth, and sixth primary sources. Of particular interest is their citing EPA's emissions study showing that automobiles on unpaved roads may produce up to 75 pounds of fugitive dust per vehicle mile traveled (VMT). The EPA developed an emission factor for vehicles on unpaved roads:*

$$E = (0.81) (s) \left(\frac{S}{30} \right) \left(\frac{365 - w}{365} \right)$$

Where E = lb of fugitive emissions / VMT

s = silt content of road surface material, %

S = average vehicle speed, mph

w = mean annual number of days with 0.01 in. or more of rainfall

**Hesketh and Cross also cite an expert as stating that this equation might be modifiable for trucks on haul roads by pro-rating for truck tire surface.*



Water Well And Pump Record

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



Import ID:

Tax No:	Permit No:	County: Charlevoix	Township: Hayes
Well ID: 15000005534		Town/Range: 34N 07W	Section: 12
		Well Status: Active	WSSN:
Elevation:		Distance and Direction from Road Intersection: 2 BLOCKS SOUTH OF 31 IN BAY SHORE	
Latitude: 45.35816		Well Owner: KEVIN WILLIS	
Longitude: -85.09907		Well Address: 10547 SPRING CHARLEVOIX, MI 49720	
Method of Collection: Interpolation-Map		Owner Address: 10547 SPRING CHARLEVOIX, MI 49720	

Drilling Method: Rotary	Well Use: Household	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 54.00 ft.	Date Completed: 8/4/1984	Pump Installation Date:	HP: 0.33
Well Type: Unknown	Height:	Manufacturer: Goulds	Pump Type: Submersible
Casing Type: Steel - unknown	Casing Joint: Unknown	Model Number: 7EH03422	Pump Capacity:
Casing Fitting: Unknown	Diameter: 4.00 in. to	Drop Pipe Length:	Pump Voltage: 220
Borehole:		Drop Pipe Diameter:	Drilling Record ID:
		Draw Down Seal Used: Unknown	
		Pressure Tank Installed: No	
		Pressure Relief Valve Installed:	

Static Water Level: 32.00 ft. Below Grade
Well Yield Test: at 9 GPM
Yield Test Method: Unknown

Screen Installed: Yes
Screen Diameter: 4.00 in.
Screen Material Type: Stainless steel-wire wrapped
Screen Installation Type: Unknown
Slot Length Set Between
15.00 5.00 ft. 49.00 ft. and 54.00 ft.

Fittings: Neoprene packer

Well Grouted: Yes
Grouting Material: Bentonite slurry
Grouting Method: Unknown
Bags Additives Depth
None

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:
Type Distance Direction
Septic tank 60 ft. East

Abandoned Well Plugged: Unknown

Casing Removed:

Geology Remarks:

Drilling Machine Operator Name:
Employment: Unknown

Contractor Type: Water Well Drilling Contractor Reg No: 15-0975
Business Name: KORTHASE WELL DRILLING
Business Address: WALLOON LAKE, MI

Water Well Contractor's Certification

This well and/or pump installation was performed under my registration.

Signature of Registered Contractor

Date

General Remarks:

Other Remarks:



Water Well And Pump Record

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

Failure to comply is a misdemeanor.



Import ID:

Tax No: 15-007-156-924-35

Permit No: c20-178

County: Charlevoix

Township: Hayes

Well ID: 15000004510

Elevation:

Latitude: 45.35844

Longitude: -85.10005

Method of Collection: Interpolation-Map

Town/Range:
34N 07W

Section:
12

Well Status:
Active

WSSN:

Source ID/Well No:

Distance and Direction from Road Intersection:
300' W of Spring St. & 350' S of US 31

Well Owner: Ellen Beek

Well Address:

06179 Bay Shore Woods
Charlevoix, MI 49720

Owner Address:

461 E Crozier rd.
Charlevoix, MI 49720

Drilling Method: Cable Tool

Well Depth: 62.00 ft.

Well Type: New

Well Use: Household

Date Completed: 10/19/2020

Casing Type: Steel - black

Casing Joint: Welded

Casing Fitting: Drive shoe

Height: 1.50 ft. above grade

Diameter: 4.00 in. to 58.00 ft. depth

Borehole: 3.90 in. to 62.00 ft. depth

Static Water Level: 30.00 ft. Below Grade

Well Yield Test:

Yield Test Method: Bailer

Pumping level 34.50 ft. after 0.50 hrs. at 14 GPM

Screen Installed: Yes

Filter Packed: No

Screen Diameter: 4.00 in.

Blank: 1.50 ft. Above

Screen Material Type: Stainless steel-wire wrapped

Screen Installation Type: Telescoped

Slot

Length

Set Between

12.00

4.00 ft.

58.00 ft. and 62.00 ft.

Fittings: Neoprene packer

Well Grouted: Yes

Grouting Method: Driven/dry grout

Grouting Material

Bags

Additives

Depth

Bentonite dry granular

1.00

None

0.00 ft. to 55.00 ft.

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:

Type

Distance

Direction

Septic tank

80 ft.

North-Northwest

Pump Installed: Yes

Pump Installation Date: 10/20/2020

Manufacturer: Other

Model Number: unknown

Drop Pipe Length: 50.00 ft.

Drop Pipe Diameter: 1.00 in.

Draw Down Seal Used: No

Pump Installation Only: No

HP: 0.50

Pump Type: Submersible

Pump Capacity: 10 GPM

Pump Voltage: 230

Drilling Record ID:

Pressure Tank Installed: No

Pressure Relief Valve Installed: No

Formation Description

Thickness

Depth to Bottom

Brown Sand & Gravel

62.00

62.00

Geology Remarks:

Drilling Machine Operator Name: Kevin

Employment: Employee

Contractor Type: Water Well Drilling Contractor

Reg No: 15-1807

Business Name: Thomas Well Drilling Co

Business Address: 11285 Phelps Road, East Jordan, MI, 49727

Water Well Contractor's Certification

This well and/or pump installation was performed under my registration.

Signature of Registered Contractor

Date

General Remarks: Well drilled and owners pump installed with pitless adaptor. No tank or controls installed by contractor.

Other Remarks: Pump Manufacturer: owners pump

Water Well And Pump Record

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



Import ID:

Failure to comply is a misdemeanor.

Tax No:		Permit No: P870219		County: Charlevoix		Township: Hayes		
Well ID: 15000005276				Town/Range:	Section:	Well Status:	WSSN:	Source ID/Well No:
				34N 07W	2	Active		
Elevation:				Distance and Direction from Road Intersection:				
Latitude: 45.36795				LOT 1-2 MICHIGAN SHORE 200FT EAST OF US 31				
Longitude: -85.12082				Well Owner: TIM FISHER				
Method of Collection: Interpolation-Map				Well Address:			Owner Address:	
				07857 9 MILE POINT CHARLEVOIX, MI 49720			07857 9 MILE POINT CHARLEVOIX, MI 49720	
Drilling Method:								

Drilling Method: Rotary		Pump Installed: Yes	Pump Installation Only: No
Well Depth: 40.00 ft.	Well Use: Household	Pump Installation Date:	HP: 0.50
Well Type: Unknown	Date Completed: 7/29/1987	Manufacturer: Goulds	Pump Type: Submersible
Casing Type: Steel - unknown	Height: 1.00 ft. above grade	Model Number: 10EJ05422	Pump Capacity:
Casing Joint: Threaded & coupled		Drop Pipe Length:	Pump Voltage: 220
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter:		Draw Down Seal Used: Unknown	
		Pressure Tank Installed: No	
Borehole:		Pressure Relief Valve Installed: No	
Static Water Level: 1.00 ft. Below Grade			

Static Water Level: 1.00 ft. Below Grade Well Yield Test: at 40 GPM Yield Test Method: Unknown			
	Formation Description	Thickness	Depth to Bottom
	Sand	20.00	20.00
	Gravel	16.00	36.00
	Limestone	4.00	40.00
Screen Installed: Yes Filter Packed: No			

Screen Installed: Yes Filter Packed: No Screen Diameter: 4.00 in. Blank: Screen Material Type: Stainless steel-wire wrapped Screen Installation Type: Unknown Slot Length Set Between 15.00 10.00 ft. 30.00 ft. and 40.00 ft. Fittings: Neoprene packer	Limestone	4.00	40.00
Well Grouted: Yes Grouting Method: Unknown			

Well Grouted: Yes	Grouting Method: Unknown	Geology Remarks:
Grouting Material	Bags Additives Depth	
Bentonite slurry	None 0.00 ft. to 26.00 ft.	
Wellhead Construction		

Wellhead Completion: Pitless adapter			Drilling Machine Operator Name: Employment: Unknown
Nearest Source of Possible Contamination:			
Type	Distance	Direction	
None			

Nearest Source of Possible Contamination:			Drilling Machine Operator Name:		
Type	Distance	Direction	Employment: Unknown		
None					
Abandoned Well Plugged: Unknown			Contractor Type: Water Well Drilling Contractor		
			Business Name: KORTH & SONS		
			Reg No: 15-0975		

Abandoned Well Plugged: Unknown	Contractor Type: Water Well Drilling Contractor	Reg No: 15-0975
	Business Name: KORTHASE WELL DRILLING	
	Business Address: WALLOON LAKE, MI	

<p>Casing Removed:</p>	<p>WALTON LAKE, MI</p>
	<p>Water Well Contractor's Certification</p> <p>This well and/or pump installation was performed under my registration.</p>

Casing Removed:	This well and/or pump installation was performed under my registration.
-----------------	---

General Remarks:	Signature of Registered Contractor	Date
------------------	------------------------------------	------

Other Remarks:



Water Well And Pump Record

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



Import ID:

Tax No: 00740001600

Permit No:

County: Charlevoix

Township: Hayes

Well ID: 15000000796

Town/Range:
34N 07W

Section:
1

Well Status:
Active

WSSN:

Source ID/Well No:

Elevation: 594 ft.

Latitude: 45.3676132833

Longitude: -85.1162642083

Method of Collection: Interpolation-Map

Distance and Direction from Road Intersection:

LOT 16, MICHIGAN SHORES SUB 4/10 MILE OFF US31 ON NORTH SIDE OF 9 MILE POINT ON LAKE

Well Owner: D. C. KATTERMAN

Well Address:

6947 NINE MILE PT DR
CHARLEVOIX, MI 49720

Owner Address:

6947 NINE MILE PT DR
CHARLEVOIX, MI 49720

Drilling Method: Cable Tool

Well Depth: 41.00 ft.

Well Type: Replacement

Well Use: Household

Date Completed: 8/7/1972

Casing Type: Unknown

Height: 0.00 ft. below grade

Casing Joint: Threaded & coupled

Casing Fitting: Drive shoe

Diameter: 4.00 in. to 36.00 ft. depth

Borehole:

Pump Installed: Yes

Pump Installation Date:

Manufacturer: Other

Model Number:

Drop Pipe Length: 26.00 ft.

Drop Pipe Diameter:

Draw Down Seal Used: No

Pressure Tank Installed: No

Pressure Relief Valve Installed: No

Pump Installation Only: No
HP:

Pump Type: Submersible

Pump Capacity: 0 GPM

Pump Voltage:

Drilling Record ID:

Static Water Level: 4.00 ft. Below Grade

Well Yield Test:

Yield Test Method: Unknown

Formation Description

Thickness

Depth to
Bottom

Boulders W/Clay W/Gravel

36.00

36.00

White Sand

5.00

41.00

Screen Installed: Yes

Filter Packed: No

Screen Diameter: 4.00 in.

Blank: 1.00 ft. Above

Screen Material Type: Stainless steel-wire wrapped

Screen Installation Type: Unknown

Slot

Length

Set Between

7.00

5.00 ft.

36.00 ft. and 41.00 ft.

Fittings: Neoprene packer

Well Grouted: No

Geology Remarks:

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:

Type

Distance

Direction

None

Drilling Machine Operator Name:

Employment: Unknown

Abandoned Well Plugged: No

Reason Not Plugged: Unknown

Contractor Type: Water Well Drilling Contractor

Reg No: 15-0412

Business Name:

Business Address:

Water Well Contractor's Certification

This well was drilled under my supervision and this report is true to the best of my knowledge and belief.

Signature of Registered Contractor

Date

General Remarks: DF 9/27/22 WELL DESCRIPTION, SCREEN, REG #, CONTRACTOR

Other Remarks: Pump Manufacturer: REDA

Water Well And Pump Record

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

Wellogic

Import ID:

Failure to comply is a misdemeanor.

Tax No:	Permit No:	County: Charlevoix		Township: Hayes	
Well ID: 15000005254		Town/Range: 34N 07W	Section: 1	Well Status: Active	WSSN:
		Source ID/Well No:			
		Distance and Direction from Road Intersection: FROM THE HIGHWAY 1/4 TO 1/2 MILE ON SOUTH SIDE OF 9 MILE POINT AND LAKE MI			
		Well Owner: TIM B			
Elevation:		Well Address:		Owner Address:	
Latitude: 45.36666		06730 9 MILE POINT CHARLEVOIX, MI 49720		CHARLEVOIX, MI	
Longitude: -85.11454					
Method of Collection: Interpolation-Map					
Drilling Method: Cable Tool					

Drilling Method: Cable Tool		Pump Installed: Yes	Pump Installation Only: No
Well Depth: 43.00 ft.	Well Use: Household	Pump Installation Date:	HP: 0.33
Well Type: Unknown	Date Completed: 6/3/1974	Manufacturer: Goulds	Pump Type: Submersible
Casing Type: Unknown	Height:	Model Number: 7EH03411	Pump Capacity: 12 GPM
Casing Joint: Threaded & coupled		Drop Pipe Length: 63.00 ft.	Pump Voltage: 230
Casing Fitting: Drive shoe		Drop Pipe Diameter:	Drilling Record ID:
Diameter:		Draw Down Seal Used: Unknown	
		Pressure Tank Installed: No	
Borehole:		Pressure Relief Valve Installed: No	
Static Water Level: 28.00 ft. Below Grade			

Static Water Level: 28.00 ft. Below Grade Well Yield Test: Pumping level 33.00 ft. after 1.50 hrs. at 25 GPM		Yield Test Method: Unknown	
Screen Installed: Yes Screen Diameter: in. Screen Material Type: Stainless steel-wire wrapped Screen Installation Type: Unknown Slot Length Set Between		Filter Packed: No Blank:	
Fittings: Other			
Well Grouted: Yes		Grouting Method: Unknown	

Well Grouted: Yes	Grouting Method: Unknown		
Grouting Material Unknown	Bags Additives None	Depth	Geology Remarks:
Wellhead Completion:	Pitless adapter		

Wellhead Completion:	Pitless adapter
Nearest Source of Possible Contamination:	Drilling Machine Operator Name:
Type	Employment: Unknown
One	
	Contractor Type: Water Well Drill

<p>Abandoned Well Plugged: Unknown</p> <p>Casing Removed:</p>	<p>Contractor Type: Water Well Drilling Contractor Reg No: 15-0269</p>
	<p>Business Name: LEO GOLDSMITH WELL DRILLING</p>
	<p>Business Address: BOYNE FALLS, MI</p>
	<p align="center">Water Well Contractor's Certification</p> <p>This well and/or pump installation was performed under my registration.</p>

Casing Removed:		The well and/or pump installation was performed under my registration.	
General Remarks:		Signature of Registered Contractor	Date
Other Remarks: Screen Fittings: LEAD PACKER			
P-2017 (4/2010)		Page 1 of 1	



Water Well And Pump Record

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



Import ID:

Tax No:

Permit No:

County: Charlevoix

Township: Hayes

Well ID: 15000005252

Town/Range:
34N 07W

Section:
1

Well Status:
Active

WSSN:

Source ID/Well No:

Elevation:

Latitude: 45.36568

Longitude: -85.11463

Method of Collection: Interpolation-Map

Distance and Direction from Road Intersection:
3/4 MILE WEST OF 31 & MICH SHORE DRIVE

Well Owner: JOHN HEISE

Well Address:

06585 MICHIGAN SHORE
CHARLEVOIX, MI 49720

Owner Address:

06585 MICHIGAN SHORE
CHARLEVOIX, MI 49720

Drilling Method: Cable Tool

Well Depth: 32.00 ft.

Well Type: Unknown

Well Use: Household

Date Completed: 7/19/1976

Casing Type: Unknown

Height: 2.00 ft. above grade

Casing Joint: Threaded & coupled

Casing Fitting: Drive shoe

Diameter: 4.00 in. to 30.00 ft. depth

Borehole:

Pump Installed: No

Pressure Tank Installed: No

Pressure Relief Valve Installed: No

Static Water Level: 24.00 ft. Below Grade

Well Yield Test:

Yield Test Method: Unknown

Pumping level 30.00 ft. after 6.00 hrs. at 12 GPM

Formation Description

Thickness

Depth to
Bottom

Limestone W/Sand W/Gravel

25.00

25.00

Limestone Broken Water Bearing

7.00

32.00

Screen Installed: No

Intake: Bedrock Well

Well Grouted: Yes

Grouting Method: Unknown

Grouting Material
Bentonite slurry

Bags

Additives

None

Depth

0.00 ft. to 32.00 ft.

Geology Remarks:

Wellhead Completion: 12 inches above grade

Nearest Source of Possible Contamination:

Type

Septic tank

Distance

60 ft.

Direction

South

Drilling Machine Operator Name:

Employment: Unknown

Abandoned Well Plugged: Unknown

Contractor Type: Water Well Drilling Contractor

Reg No: 15-0987

Business Name: PUTMAN WELL DRILLING

Business Address: CHARLEVOIX, MI

Water Well Contractor's Certification

This well and/or pump installation was performed under my registration.

Casing Removed:

Signature of Registered Contractor

Date

General Remarks:

Other Remarks:



Water Well And Pump Record

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



Import ID:

Tax No:

Permit No: 860181

County: Charlevoix

Township: Hayes

Well ID: 15000005590

Town/Range:
34N 07W

Section:
12

Well Status:
Active

WSSN:

Source ID/Well No:

Distance and Direction from Road Intersection:

Elevation:

Latitude: 45.36095

Longitude: -85.09881

Method of Collection: Interpolation-Map

Well Owner: COLETTE DESCHERMEIER

Well Address:

06132 DIVISION
CHARLEVOIX, MI 49720

Owner Address:

06132 DIVISION
CHARLEVOIX, MI 49720

Drilling Method: Rotary

Well Depth: 113.00 ft.

Well Type: Unknown

Well Use: Household

Date Completed: 7/23/1986

Casing Type: Steel - unknown

Height: 1.00 ft. above grade

Casing Joint: Unknown

Casing Fitting: Drive shoe

Diameter:

Borehole:

Pump Installed: Yes

Pump Installation Date:

Manufacturer: Unknown

Model Number:

Drop Pipe Length:

Drop Pipe Diameter:

Draw Down Seal Used: Unknown

Pump Installation Only: No
HP:

Pump Type: Submersible

Pump Capacity:

Pump Voltage:

Drilling Record ID:

Pressure Tank Installed: No

Pressure Relief Valve Installed: No

Static Water Level: 45.00 ft. Below Grade

Well Yield Test:
at 50 GPM

Yield Test Method: Unknown

Screen Installed: No

Intake: Bedrock Well

Formation Description

Thickness

Depth to
Bottom

Clay Soft

16.00

16.00

Blue Clay

8.00

24.00

Limestone Broken

63.00

87.00

Blue Clay Hard

4.00

91.00

Brown Clay

5.00

96.00

Brown Unidentified Consolidated Fm

17.00

113.00

Brown Clay Blue

1.00

114.00

Well Grouted: Yes

Grouting Method: Unknown

Grouting Material
Bentonite slurry

Bags Additives
None

Depth
0.00 ft. to 102.00 ft.

Geology Remarks:

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:

Type
Unknown

Distance

Direction

Drilling Machine Operator Name:

Employment: Unknown

Abandoned Well Plugged: Unknown

Contractor Type: Water Well Drilling Contractor

Reg No: 15-0975

Business Name: KORTHASE WELL DRILLING

Business Address: WALLOON LAKE, MI

Water Well Contractor's Certification

This well and/or pump installation was performed under my registration.

Signature of Registered Contractor

Date

General Remarks:

Other Remarks: