

## S T A T E O F M I C H I G A N

## BOARD OF COMMISSIONERS OF THE COUNTY OF ALLEGAN

**BOARD OF COMMISSIONERS - ACCEPT WATER STUDY WORKGROUP FINAL REPORT**

**WHEREAS**, on June 10, 2021, the Allegan County Board of Commissioners (Board) established the Allegan County Water Study Workgroup (Workgroup); and

**WHEREAS**, the Workgroup finalized its recommendations to the Board of Consideration during its last meeting on February 19, 2025; and

**WHEREAS**, the County Administrator and Health Officer have reviewed the recommendations; and

**WHEREAS**, the Workgroup has completed its tasks; and

**WHEREAS**, the County Health Officer will continue to work with County Administration on recommendations and solicit input from the former members of the Workgroup to carry out the duties outlined within the report.

**THEREFORE, BE IT RESOLVED**, that the Board accepts the final report, as presented; and

**BE IT FURTHER RESOLVED** that the Board dissolves the Allegan County Water Study Workgroup effective immediately; and

**BE IT FINALLY RESOLVED** the Board expresses its gratitude to each member of the Workgroup for their dedication to this project.

# Allegan County Ground Water Study Ad-Hoc Work Group



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## Final Report

February 20, 2025

The Allegan County Water Study Ad-Hoc Work Group (WSW) was formed by the action of the Board of Commissioners in 2022 with the purpose of advising the Board on aspects of Allegan County's current and future state relative to water quality and quantity.

The charge given to the WSW is as follows.

### Workgroup Tasks and Deliverables:

1. Review the final Allegan County Groundwater Study, conducted by Hydrosimulatics, INC. and submitted to the Board on March 25, 2021.
2. Provide regular updates to the Board and a final written summary of observations and recommendations of the workgroup, within one-year of the appointment of its members, relative to the study content (and any other aspects of Allegan County's current and future state relative to water quality, including recommendations for how the County (as a geographic area) should proceed with next steps (if any) and provide particular focus on Hydrosimulatics, INC. recommendation to pursue an interactive Decision Support System. All recommendations must be specific as to the management/oversight model, funding, root need/issue to be addressed and expected results of any next steps to be considered.
3. The Allegan County Health Department will participate in the discussions of the work group and will provide administrative support, guidance and expertise.
4. As an ad-hoc workgroup, the work of the group will be considered complete upon the delivery of item number 2 above.

The WSW consists of the following members:

Tom Kunetz, Chair and Community Representative  
John “Ric” Curtis, Vice-chair and Community Representative  
Dean Kapenga, Former Commissioner Representative  
Brad Lubbers, Agriculture Representative  
Chad Kraai, Well Driller Representative  
Brian Talsma, Conservation District Representative  
Doug Sweeris, Municipal Water Supply Representative  
Elizabeth Binoniemi-Smith, Tribal Representative  
Ruth Kline-Robach, Academic Representative  
Jaclyn Hulst, Community Representative  
Zach Curtis, Consultant Representative

Randy Rapp, Allegan County Health Department Staff Liaison

The WSW has completed our charge, and provided advice, offered support, and accomplished tasks above and beyond the initial outcomes envisioned by the Board. It is now time to sunset the WSW. This represents the final report and final action of the WSW.

As directed in our charge, the report is organized by our observations, root needs/issues, a corresponding recommendation, management/oversight model, funding, actions and outcomes, and recommended next steps.

We encourage the Board to follow through with the recommendations for which action has not yet been taken. We respectfully request the Board to continue keeping groundwater management at the forefront of its efforts to ensure the health and economic well-being of the citizens, tribal community, agriculture sector and businesses in the county.

Abbreviations used in this report

WSW: Water Study Workgroup

BOC: Board of Commissioners

LUG: Local Unit of Government

ARPA: American Rescue Plan Act

ACHD: Allegan County Health Department

EGLE: Michigan Department of Environment, Great Lakes, and Energy

LUST: Leaking underground storage tank

CAAC: Community Action of Allegan County

MGS: Michigan Geological Survey

MDHHS: Michigan Department of Health and Human Services

GAR: Groundwater Assessment Report

RIDE: Remediation Information Data Exchange

WHPP: Wellhead Protection Program (EGLE)

ODC: Outdoor Discovery Center

## OBSERVATION 1: LOCAL WATER PROJECTS

Some municipal water systems in the County are in need of repair to provide quality drinking water to their customers. In addition, the quality of groundwater may be impaired by leaking municipal sewerage systems.

### Root Need/Issue

Municipal water systems must be in good operating condition for the utility to meet its obligation of providing safe drinking water to its customers. Infrastructure projects reduce the risk of failing septic and sewer systems contaminating the groundwater.

### Recommendation

Provide grants to municipalities in need of funding to repair underperforming water and sewerage systems.

### Management/Oversight Model

The WSW established criteria in order to review the requests for funding to meet certain thresholds to demonstrate need, impact to groundwater, and define the scope of work.

### Funding

Up to a combined total of \$2 million to be paid from County's share of ARPA funds. Municipalities must provide at least an equal cost share.

### Actions and Outcomes

WSW reviewed ten requests from municipal systems, then made a recommendation to the BOC for funding five of the requests that met the established criteria. The BOC approved all recommendations for funding as follows:

|                    |                 |                |
|--------------------|-----------------|----------------|
| City of Allegan    | Water and Sewer | \$525,426.00   |
| City of Otsego     | Sewer           | \$266,105.23   |
| City of Otsego     | Water           | \$153,619.11   |
| City of Plainwell  | Water           | \$395,333.00   |
| Saugatuck Township | Water           | \$350,000.00   |
| Total              |                 | \$1,690,483.34 |

### Recommendations for Next Steps

None

## OBSERVATION 2: PHASE 2 STUDY

The report “Phase 1--Understanding the Big Picture,” prepared by Hydrosimulatics, INC and delivered March 22, 2021 provides an overview of the geologic and hydrogeologic conditions of Allegan County. The report recommended that the County proceed with “Phase 2--Screening Level Modeling, Risk Analysis, and Ranking” to further understand the potential risks that known sites of contamination pose to the quality of the groundwater supply.

### Root Need/Issue

The office of Environment, Great Lakes and Energy (EGLE) has been collecting contamination data for decades. There are approximately 289 sites of environmental concern across Allegan County, according to the EGLE database. These are point sources where a pollutant was potentially or likely discharged into the groundwater, or on the ground surface and may have the potential to leach into the aquifer. Once in the aquifer, these pollutants may migrate to a private or public well.

A computer model can predict the probability that pollutants can reach the aquifer from the surface (aquifer vulnerability), the path that pollutants could take to migrate from the source once in the aquifer (migration pathway), the speed of migration of the plume, and identification of known public or private wells within or near the site or downstream migratory plume. Wells that are in the greatest risk for contamination in the near term or longer term can be identified. With this information, the appropriate authorities can take preemptive action to prevent contaminants from reaching wells or provide treatment for contaminated wells.

### Recommendation

The County should proceed to contract with Hydrosimulatics, INC to prepare the report “Phase 2--Screening Level Modeling, Risk Analysis, and Ranking.”

### Management/Oversight Model

Hydrosimulatics, INC. of Lansing, MI was retained to conduct the work. The project was managed by the Allegan County Health Department (ACHD) project manager, with oversight and input provided by the WSW.

### Funding

\$127,000.00 paid from the County’s ARPA funds.

### Actions and Outcomes

The BOC approved the contract with Hydrosimulatics, INC. The initial Phase 2 report was delivered March 14, 2023, then addended at the direction of the WSW to add 62 LUST sites to the evaluation, with the addended report delivered June 12, 2023.

The sites of groundwater concern investigated in the Phase 2 analysis included: 237 Sites of Environmental Contamination (Part 201) downloaded August 2022 from the RIDE Mapper web application maintained by EGLE; 46 historical or operational landfills or waste handlers (Part 105, Part 111) downloaded August 2022 from the Michigan Geographic Information System (GIS) data portal; five Per- and polyfluoroalkyl substances (PFAS) sites downloaded August 2022 from the EGLE's MPART PFAS Geographic Information System. Additionally, 68 "Open" (Active) leaking underground storage tank (LUST) sites from the Environmental Mapper application were included in the first analysis plus 62 sites added by addendum. Accounting for some duplication, the total number of unique sites analyzed for the study was 351.

Each site was subject to particle tracking simulation via the computer model. Predictions were made as to the path of the plume of contaminated groundwater in the 2, 10 and 20-year time frames. This information was then overlayed on a map of well locations across the County along with aquifer vulnerability. Each of the 351 sites was then evaluated and scored according to weighted criteria of potential risks based on proximity to: drinking water, non-drinking water (e.g. irrigation well), surface water, and aquifer vulnerability. Individual scores for each category were then totaled to determine urgency to the highest-ranked sites. The contaminant was not catalogued for each site. Therefore, human health impact was not included in the scope of this study.

The Phase 2 Report contained four recommendations for further action. The WSW recommended pursuing recommendation numbers 1 and 2 as follows:

- 1.) Proceed to add 62 LUST sites to the database and risk ranking. This was completed as noted above.
- 2.) Determine the nature of the contamination at the highest ranked sites. After determining the nature of contamination, establish the risk to human health based on toxicology and risk exposure analysis. This was completed and is provided in the Groundwater Assessment Report. See Observations 3 for details.

The Top 30 sites of concern are shown on a map in Appendix A. The Phase 2 report can be found at this site:

<https://www.Allegancounty.org/Connect/Projects/Water-Study>

then under "Resources" on the side bar.

A copy of the Phase 2 report was forwarded to the director of EGLE by the county administrator on November 8, 2023.

### Recommendation for Next Steps

It is recommended that the County forward to the leaders of LUGs the Top 30 list, along with the downstream impact area maps to inform them of the risk of possible well contamination and encourage them to work directly with EGLE for site remediation.

## OBSERVATION 3: GROUNDWATER ASSESSMENT REPORT

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The Phase 1 and Phase 2 reports laid the groundwork for understanding the current state of conditions regarding the quantity and the quality of the groundwater in the County. However, these reports did not answer the essential questions: “Do we have enough water,” and “Is human health at risk?” The entities that have authority over these matters--the LUGs, EGLE and MDHHS--would benefit from a comprehensive, understandable report that provides them with the information they need to influence and guide the management and protection of this shared groundwater resource with respect to these two essential questions. The County is in a position to undertake the efforts to assemble this information and then connect LUG and state agencies to facilitate action.

### Root Need/Issue

The Phase 1 report presented the state of the aquifers and geology of Allegan County. However, this review did not delve into the issue of water “quantity,” in particular, understanding the three essential questions related to water availability:

- 1) How much water reserves are in the aquifers?
- 2) What is the current demand for this water across all sectors (residential, agriculture, commercial)?
- 3) What is the predicted future demand for this water across all sectors?

The Phase 2 report identified wells at risk for receiving plumes from known sites of environmental concern, but the actual human health risk was not quantified since the pollutants in those plumes were not identified. What is needed is an evaluation of risks to groundwater from substances that exceed established drinking water standards related to human health, and aesthetic qualities, like taste, smell, or color. The containment, removal, or treatment of contaminants in groundwater is often difficult and costly. Once groundwater is polluted, remediation can take years, and millions of dollars, if at all possible. Characterizing groundwater contamination is necessary to identify the sites at risk so that mitigation or cleanup activities can be justified

### Recommendation

The County should retain a consulting firm to develop a comprehensive Groundwater Assessment Report to be shared with LGUs, EGLE, MDHHS, and other stakeholders. The Groundwater Assessment Report should cover these issues:

- 1) A brief explanation of aquifers and groundwater movement.
- 2) Groundwater Protection Area delineation for the entire County
- 3) Water quality risks, and areas of concern
- 4) Groundwater demands and future use projections.

### Management/Oversight Model

Williams & Works from Grand Rapids, Michigan was contracted to complete the project. Hydrosimulatics INC. was subcontracted to perform some of the technical work.

### Funding

\$160,225.00 paid to Williams & Works for the Groundwater Assessment Report from the County's ARPA funds.

### Actions and Outcomes

The BOC approved the contract with Williams & Works.

The Groundwater Assessment Report was delivered September 16, 2024, with the following results.

- a. Delineation of the County's Groundwater Protection Area ("ground-watershed"), including areas outside of the County where groundwater flows toward Allegan.
- b. Determination of the nature of contamination (documentation review and site history inventory) for 351 sites of groundwater concern (point sources of potential pollution) based on information from the State of Michigan EGLE RIDE system.
- c. Establishment of the risk to human health based on toxicology and risk exposure analysis.
- d. Updated site risk rankings, combining Phase 2 hydrogeologic risk analysis with exposure risk rankings.
- e. Documented in detail the site history/status of the Top 30 sites of groundwater concern (in one centralized document).
- f. Mapping of non-point source pollution metrics (using WaterCHEM water quality data collected from water wells).
- g. Creation of a Composite risk map (combining point source risk, non-point source risk, and CDC social vulnerability index).
- h. Calculation of current and future groundwater demand (up to year 2050) based on Wellogic water well database and typical water use rates (by sectors).

The County and its contracted consultant convened leaders from local government and other stakeholders for two Allegan County Groundwater Workshops in which the GAR was presented. The GAR was used as the foundation for educating the local leaders and to stimulate discussions. See Observation 8.

The Groundwater Assessment Report can be found online at this site:

<https://www.Allegancounty.org/Connect/Projects/Water-Study>

then under “Resources” on the sidebar.

A list of data sources presented in the Allegan County Groundwater studies is provided in Appendix C.

#### Recommended Next Steps

It is recommended that the GAR be updated every 5 to 10 years, focusing on:

- a) Updating current and future groundwater demand in comparison with predicted demands and groundwater reserves, as measured by the monitoring well network,
- b) Adding or removing sites of concern of groundwater contamination,
- c) Updating the list of Top 30 sites of groundwater concern.

### OBSERVATION 4: GROUNDWATER TABLE MONITORING

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Based on the results of the Groundwater Assessment Report, cumulative groundwater overuse does not appear to be an imminent threat in Allegan County. However, some areas are projected to grow faster in population and therefore experience limited groundwater resources, warranting long-term monitoring and planning.

#### Root Needs/Issue

Understanding how much groundwater is available in the aquifer is essential in order for the LUGs to be able to make decisions with respect to meeting water demand for residents, businesses, and agriculture. However, as aquifers are beneath the surface of the earth, and therefore invisible to direct observation, it is not possible to know at any given moment how much water is available, or if the reserves are being depleted or recharged. The state of the groundwater reserves can be approximated by observing the water table in numerous points, i.e. monitoring wells, across the two aquifers.

#### Recommendation

Create a network of groundwater level monitoring wells in geologically strategic locations across the county so that the volume of water stored in the two aquifers can be observed over time, to inform management strategies.

### Management/Oversight Model

The Michigan Geological Survey (MGS) approached the WSW with the suggestion to partner on the monitoring well program. MGS plans to take soil borings at sites throughout the County. Normally, after the soil samples are taken, the bore hole is backfilled with soil. However, rather than be backfilled, well equipment can be installed, and the hole turned into a monitoring well. In this approach, there is a cost savings to the County from not having to bore the hole. There is a further benefit to the County in that MGS will manage the contract with the well driller, install the well equipment, water level sensors, dataloggers, and telemetry. Allegan County will then reimburse MGS for the cost of all the monitoring well equipment. This relieves the County of the need to administer its own contract to install the monitoring wells.

### Funding

\$100,000 has been established as the not-to-exceed amount in the contract with MGS to be paid from the County's ARPA funds.

### Actions and Outcomes

The WSW identified hydrologically strategic locations throughout the county where monitoring wells should be located. WSW members then performed local reconnaissance of the target areas to identify potential specific sites for locating the monitoring wells in spots where they are accessible, yet out of harm's way, and preferably on public land. ACHD staff used this information to meet with local leaders to site the monitoring wells on public land and execute an agreement with the municipality. ACHD then worked in partnership with the MGS to install the monitoring wells, water level sensors, dataloggers and telemetry. To date, 15 groundwater level monitoring wells have been installed in the network, and three more are planned in 2025 for a total of 18 monitoring wells. The water sensors, dataloggers, and telemetry has not yet been installed, but this work is scheduled for 2025. Appendix B shows the location of each of these wells.

This groundwater table monitoring well network will act in somewhat the same way that a gas gauge in a car measures the amount of fuel in the tank. Monitoring the collective data in these wells over the long term will enable the County to "sound the alarm" if the volume of water in the aquifers dips below a secure level, so that proactive actions can be taken before a crisis exists.

### Recommended Next Steps

- a) ACHD should continue to coordinate with MGS to ensure the installation of the final three monitoring wells, as well as the protective bollards, water level sensors, data loggers, and telemetry for all 18 wells.
- b) ACHD should work with EGLE to get the data from the monitoring wells incorporated into the National Groundwater Monitoring Well Network.

- c) ACHD should review the data collected over a 3-year period and, working with a hydrogeologist, use this information to identify temporal water trends to establish a “low-level warning” point for each well.
- d) After the “low level warning points” are set, ACHD should assign a staff person to review the water level data and compare it to the “low-level warning points” on at least a semi-annual basis and report the results to the Health Officer. Should the data indicate a cause for concern, the Health Officer will forward the information to the LUGs to develop a coordinated effort for action.

### OBSERVATION 5: PRIVATE WELL ASSISTANCE

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The county authorized ARPA funds to be granted to municipal water systems for the purpose of upgrading water infrastructure. However, many citizens of Allegan County receive their water from on-site, private, residential wells. These residents will not benefit from the grants issued to the municipal water systems. There are pockets of low-income residents who are not connected to a municipal water supply system and who have well systems that are inadequate or failing. These residents could benefit from a share of the ARPA funds.

#### Root Need/Issue

The ACHD’s 2022-2025 Community Health Improvement Plan (CHIP), under the category of “Housing,” establishes a specific strategy aimed to “Expand access to quality water (private and municipal supply.)” Based on a survey of area well drillers, roughly 10 to 20 percent of their customers in the County have well equipment that is broken or past its useful life, and roughly 3 percent have wells that do not produce enough water to meet daily needs. Furthermore, the survey revealed that 10 to 20 percent of their customers are considered “low income” and do not have the financial resources to pay for repair or replacement.

The WSW determined that failing septic systems are related to water quality issues, in that sewage leaching from a broken septic system can contaminate the on-site well water with pathogenic bacteria. Repairing or replacing the well equipment, without addressing a failing septic system, does not fully meet the CHIP strategy for access to quality water. Therefore, it is necessary to recognize that insuring a properly functioning septic system is part and parcel to a residential well improvement plan.

#### Recommendation

The County should develop a grant program for low-income private well owners to provide financial assistance for the upgrade or replacement of wells and septic systems in disrepair or that are underperforming.

### Management/Oversight Model

Community Action of Allegan County (CAAC) will administer the Well and Septic Repair Program on behalf of the County.

### Funding

Approximately \$700,000, to be paid from the County's ARPA funds.

### Actions and Outcomes

A contract was executed on December 19, 2024 between the County and CAAC to administer the Well and Septic Repair Program on behalf of the County. CAAC partnered with the Water Trust, a national non-profit organization that is experienced in providing grants for water well assistance to low income residents, for guidance in administering the program. The recommended grant program provides sufficient funds to applicants to completely cover the costs for repair or replacement of equipment for nearly all situations for the lowest income tier, and sufficient seed money to augment the homeowner's out-of-pocket costs for the next income tier. The goal is for 100% of the property owners in the two lowest income tiers to have properly functioning wells and septic systems by the end of year 2026. The program details are available at:

<https://communityactionallegan.org/our-services/utility-assistance/>

The program will run through December 31, 2026.

### Recommended Next Steps

- a) Allegan County should monitor the progress of the program quarterly to learn how successful the program is in reaching the residents in need, and if necessary, expand outreach efforts through CAAC.
- b) Allegan County should monitor the progress of the program quarterly to learn if the benefits are successfully serving the needs of the grantees, and if not, work with CAAC to adjust the benefits accordingly.
- c) If the ARPA funding runs out and there are still applicants, the County, in concert with other stakeholders (LUGs, CAAC, Allegan County Community Foundation, etc.) should evaluate the remaining needs, and explore other options to continue the program until 100% of eligible applicants have been served.

## OBSERVATION 6: PUBLIC EDUCATION AND OUTREACH

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A common theme throughout the multi-year planning process has been the importance of implementing a comprehensive education and outreach strategy for Allegan County residents. Giving citizens a basic understanding of groundwater and how it is managed will provide the foundation necessary for local, county and state agencies to successfully manage groundwater resources. Educating the community about the origins and significance of their drinking water fosters an awareness of how individual actions and local policies impact water quantity and quality. Furthermore, public education initiatives serve as relationship-building opportunities among various agencies and the community, ensuring a collaborative approach to safeguarding water resources.

### Root Need/Issue

Educating the public about groundwater was the most frequently mentioned need for communities in the planning Workshop #2 with LUGs. Workshop participants acknowledged that education is a focus for many agencies, and it serves as a relationship-building opportunity. Groundwater education takes time and must be ongoing. By inspiring behavioral changes through a well-crafted education and outreach strategy, residents can actively participate in protecting groundwater, thereby ensuring a sustainable water supply for future generations.

### Recommendation

The Work Group recommends the development of an intentional education and outreach strategy that has a call to action and inspires behavioral changes that protect groundwater.

The strategy should include:

- Education aimed at Allegan County residents about where the county's drinking water comes from, and why it is important to protect both water quantity and water quality
- Ways in which residents can help protect water resources
- A K-12 groundwater education program

### Management/Oversight Model

The education strategy is multi-pronged. The public education and outreach activities will be performed by ACHD staff members. Education of school-age (K-12) children will be done through a contract with the Outdoor Discovery Center (ODC), with input from a Groundwater Education Steering Committee that includes representatives of the ACHD and the WSW.

### Funding

\$50,000 to ODC from the County's ARPA funds.

\$8,000 for in-house services from the County's ARPA funds.

### Actions and Outcomes

ACHD staff will develop a variety of outreach and educational materials for county residents. These include:

- 1.) An accessible website with background information and links to local and state resources for citizens. Topics to be addressed on the website will include:
  - Groundwater basics, including aquifers, groundwater flow, connection between groundwater and surface water
  - County-specific maps depicting the aquifers, locations of wells and other site-specific information such as groundwater levels derived from the monitoring wells program.
  - Risks to groundwater and the relationship between land use activities and groundwater quantity and quality
  - Ways in which residents can help protect groundwater and surface water, including well and septic system maintenance, stormwater management, and properly sealing abandoned wells.
  - Water testing information.
- 2.) A brochure outlining the information listed above for distribution at events and meetings.
- 3.) Informational posts for use on the County and Health Department websites and social media.
- 4.) Brief articles about the County's groundwater and groundwater protection strategies for inclusion in local news sources and to post to the County websites.

On December 19, 2024, the County executed a contract with ODC to develop a groundwater education program for use in local schools/education centers that will help children understand the importance of groundwater to their health and wellbeing. ODC will develop resources, purchase materials and provide professional development and field experiences for K-12 teachers. Tasks will include the following:

- Establish and facilitate a groundwater education steering team consisting of representatives from ODC, ACHD, the WSW, and schoolteachers. This input will help guide the development of an extension curriculum to ensure that it meets the needs of all stakeholders.
- Create four grade-span extensions that connect students, families, and educators to groundwater and its ancillary topics specific to Allegan County. The grade spans will include K-2, 3-4, 5-8, and 9-12.
- Purchase at least one physical model that demonstrates the mechanisms of groundwater.
- Design signage to be erected at the ODC main campus that illustrates groundwater in Allegan County and the importance of groundwater to our everyday lives.

- Arrange for professional development for twenty teachers and trainers. This task includes a per-teacher stipend to assist in covering the costs to attend professional development.

The tasks are to be completed by December 31, 2026.

#### Recommended Next Steps

The ACHD should review the results of the reports submitted by ODC to determine how effective this program was in reaching the intended audience, and to determine if the professional development and outreach components should be renewed for another term.

### OBSERVATION 7: PARTNERING

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Jurisdiction over groundwater quality and withdrawal does not lie with any one government entity; rather, it resides in pieces across different entities. Allegan County has its Water and Sewer Regulations that govern the installation of wells and septic systems. The ACHD inspects new private wells to ensure that they meet local, County and state codes, but does not provide oversight after the initial inspection. The ACHD permits and regulates Type II or non-community water supplies under County and EGLE regulations. These are wells for schools, office buildings restaurants, etc. These permitted water supplies are required to submit results of samples on a regular basis to the ACHD for review and compliance with the County Water and Sewage Regulations. Local units of government may have the authority to regulate wells beyond the County's regulations, should they choose to exercise it. Larger municipal wells or Type I water supplies are permitted by EGLE. These are wells for mobile home parks, cities, villages, etc. EGLE requires the submission of a water withdrawal assessment for large withdrawals over 70 gallons per minute and irrigation wells.

EGLE has the legal authority to cite polluters who cause contamination of the groundwater, and force clean-up or mitigation measures. EGLE and MDHHS works with local authorities and the local health departments to help educate, monitor and mitigate the effects of the contamination on the affected population. No entity has control over natural causes of groundwater contamination.

#### Root Need/Issue

It is evident that in order to provide some form of stewardship of the groundwater supply so that it remains viable and safe for all the users (residential, agriculture, commercial, tribal) of this common resource, cooperation must exist between the various government and tribal entities. The County government seems to be best positioned to serve the role of facilitator or "point-person" between the various local and state government agencies on behalf of all the users of the shared aquifers.

By maintaining channels of communication with neighboring counties, LUGs, EGLE and MDHHS, the County can bring the concerns of groundwater contamination to the forefront with the agencies that have the legal authority, the expertise, and the resources to take action.

By serving as a convener, the County can bring together the leaders of the LUGs to educate them on the state of the groundwater situation: how it impacts them, what are the greatest concerns in the County, and how actions in one municipality affect the people in adjacent municipalities. In return, the County can learn from the LUGs their own concerns, priorities, and needs. Moreover, a convening brings the leaders together to talk to each other.

### Recommendation

The County government should adopt a perspective recognizing its unique position to serve the role as a convener and a facilitator in order to communicate, educate, and partner with all involved government entities regarding the protection and management of the groundwater resources in Allegan County.

### Management/Oversight Model

Adopting a perspective as convener and partner must start with the BOC, then be realized by the County Administrator, Health Officer, and ACHD staff by looking for opportunities to engage LUG leadership, keep state agencies well-informed of activities in the county, and educate state legislators.

### Funding

County Administration will have to determine staff capacity and if external funding is needed.

### Actions and Outcomes

- a.) On July 28, 2023, the WSW and ACHD representatives made a presentation to key staff members of EGLE, including representatives of the Remediation and Redevelopment Division, and Drinking Water and Environmental Health Division. EGLE offered use of their RIDE database for researching known contaminants at the sites of concern. WSW stressed the importance of EGLE stepping up to tackle remediation at the sites of highest risk from contamination. EGLE responded in short that they have many sites across the state to manage, there is little funding available, and little regulatory ability to hold polluters accountable for more than mitigation of pollutants in the groundwater. They recommended Allegan County talk to their state representatives for funding.
- b.) On January 8, 2024, WSW and ACHD representatives made a presentation to key staff of MDHHS. MDHHS offered to provide information that may be helpful with a private well assistance program (See Observation 5.) MDHHS requested a copy of the Phase 2 report, which may be of assistance to them. ACHD requested that MDHHS inform ACHD when an entity files for a large groundwater withdrawal permit. Currently, ACHD only finds out about it after the permit is issued, and by then it is too late to take action if it would be necessary.

- c.) WSW and ACHD representatives attended the 2024 Annual Michigan Association of Local Environmental Health Administrators conference, and the 2025 Michigan Environmental Health Association's Annual Education Conference, where they gave a presentation on the activities of the WSW including the Phase 1 and Phase 2 studies, and the Groundwater Assessment Report.
- d.) The County convened two workshops with leaders of LUGs, and representatives of EGLE, MDHHS, and Ottawa County. See Observation 8.

#### Recommended Next Steps

- a.) The County should make funding for groundwater contamination cleanup an agenda item at meetings with state legislators.
- b.) The ACHD meets with representatives of LUGs annually as part of the ACHD Strategic Plan to discuss services of the ACHD. The ACHD should add to the agenda for these meetings results of the public education efforts, a report on information gathered from the monitoring well network, and a discussion of steps the LUG can take to protect groundwater.
- c.) The County should continue to encourage County staff members to make presentations about the work the WSW has done at conferences across the state. By sharing the efforts taken by the County with others, it may encourage other counties to take up the charge of groundwater protection, thus helping put pressure on the State to take a stronger reaction to groundwater contamination cleanup and holding responsible parties accountable.

### OBSERVATION 8: WORKSHOPS

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As stated in the Recommended Next Steps for Observation 7: Partnering, the WSW recognizes that the County can play an important role as a convener to educate and facilitate discussion with LUGs regarding the protection and management of the groundwater resources in Allegan County.

#### Root Need/Issue

Authority over groundwater withdrawals resides locally, and not at the County level. Both municipal water departments and private wells are drawing from the same aquifer. Therefore, whether a LUG has a municipal water supplier, only private wells, or both, it is important for the municipal leaders to recognize that the municipality has a responsibility to take a role in protecting this resource for the collective public good. Therefore, it is vital that

the issue of “water supply” is added to a municipality’s area of concerns along with the traditional services such as roads, sanitation, zoning, and the like.

### Recommendation

The County should convene two workshops with leadership of LUGs. Workshop #1 will serve to first educate the leaders on the state of the groundwater supply and then collect feedback on issues that are of highest concern. Workshop #2 will serve to educate the leaders on different types of oversight models, foster conversation between leaders, and collect feedback on strategies that are of greatest interest to the leaders.

### Management/Oversight Model

The workshops were organized by a team consisting of representatives from ACHD, WSW, and Williams & Works consulting firm. Williams & Works prepared presentations and handouts; handled invitations and registration; facilitated the workshops; and prepared outcome reports.

### Funding

\$34,525 to be paid from the County’s ARPA funds.

### Actions and Outcomes

- a) Workshop #1 was held on April 23, 2024 at the Trestle Stop in Hamilton. It was attended by representatives from 27 different municipalities, County staff, Commissioners, WSW members, and a representative from EGLE. Presentations were made on the following topics: The ABCs of Groundwater, Areas of Concern and Water Quality Risk, and Groundwater Use and Future Demand. Following these educational presentations, attendees had a chance to ask questions of the experts, followed by small group breakout sessions to gather feedback from attendees on their concerns and suggestions.

The feedback from Workshop #1 was synthesized in a report from Williams & Works. This report was used by WSW and Williams & Works to set the agenda for Workshop #2.

- b) Workshop #2 was held on October 29, 2024 at the Trestle Stop in Hamilton. It was attended by representatives from 16 different municipalities, County staff, Commissioners, WSW members, EGLE, MDHHS and Ottawa County. Williams & Works made a presentation on case studies of different governance models of groundwater management and protection. Breakout groups then met to discuss and prioritize a list of potential strategies that could be pursued.

Attendees were asked to rank their preference for moving forward with some form of a groundwater management strategy. The choices were presented as a spectrum of approaches, from “Groundwater management is a completely local issue” on the one extreme (low end), to “Allegan County government should take full control of groundwater management” on the other extreme (high end). The responses fell towards

the high end, although not at the extreme of complete County control. The responses from the LUG leaders can be summarized as follows:

“We recognize groundwater management and protection to be an important issue for our municipality. We do not have the resources, nor the expertise to take on this work on our own. Therefore, we need the County government to take a large role in educating, communicating information, working with state agencies, and providing expertise to LUGs. However, we want to maintain the authority and control over water resources within our municipality.”

There was a mixture of responses on the suggestion to create some form of county-wide groundwater governance or oversight body, with several attendees being in favor of such, and others not. The overall concern was that of lack of financial resources to support such a body, and lack of time for leaders to devote to such a body.

#### Recommended Next Steps

Attendees at Workshop #2 scored specific strategies based on highest importance to their municipality. These recommendations have been evaluated by WSW for perceived value, but have not been vetted for cost, funding source, impact on County resources, etc. The WSW provides below a list of actions for the County’s further evaluation and consideration.

*Note: The recommendations are listed in no particular order of importance.*

- 1) Host periodic (annual) educational events, such as workshops and webinars for municipal leaders to grow their knowledge of groundwater related issues, connect with each other, and become updated on Allegan County-specific information. Provide support for local government units to help navigate processes with state and federal officials regarding groundwater contamination identification, mitigation, funding sources, and accountability claims. Existing programs and presentations provided by agencies like MSU Extension, the Allegan Conservation District, EGLE and the Michigan Water Stewardship Program, are good resources to tap into.
- 2) Organize a groundwater Technical Advisory Committee or alternatively, have on-call a less formalized group of advisors with expertise in areas such as groundwater, water supply and public health, hydrogeology, and agriculture to provide expertise and act as a sounding board to County staff.
- 3) Make an outreach effort to all Type I water system owners in the County—including mobile home parks and campgrounds—encouraging them to develop a Wellhead Protection Plan in accordance with EGLE criteria, if they do not already have one. Partner with EGLE on this effort. The County would only be involved in the outreach; assistance with development and approval of the plan would be EGLE’s responsibility.

- 4) Maintain a web-based centralized repository of all data and information collected as part of the WSW's efforts and inform LUG leaders how to access and use this repository. A summary of this data is provided in Appendix C.
- 5) Consider requiring well and septic inspections and well water testing when a property is sold or transferred. The WSW recognizes this is a complex and contentious issue for several reasons. Nevertheless, the WSW strongly encourages the County to at least hold exploratory conversations with the LUGs on this topic. The best way to manage the groundwater resource—and by extension, public health—is through data and information. The metadata collected from many sources across the County will provide future decision makers with information that will be helpful in directing management efforts.
- 6) Reinstate the County facilitating water testing.
- 7) Offer an online and printed “Homeowner Tool Kit” as an easy-to-follow guide to help individuals more sustainably use and protect local water sources and maintain septic systems. Related to Recommendation 6, this tool kit should include information for homeowners on what to do if a water sample analysis detects contamination. There are existing programs that can be utilized without having to create this tool kit from scratch.

### OBSERVATION 9: DECISION SUPPORT SYSTEM TOOL EVALUATION

The report “Phase 1--Understanding the Big Picture,” prepared by Hydrosimulatics, INC and delivered March 22, 2021 made a recommendation that the County should pursue hiring a consultant to create an interactive Decision Support System (DSS) tool to assist the County in managing the quality and quantity of the groundwater reserves. Task 2 of the charge to the WSW specifically requires the WSW to provide a recommendation as to whether the County should purchase the DSS tool.

The DSS tool is a digital platform that would, in brief:

- Provide a 3D visualization of the complex geology of the subsurface
- Map groundwater level distributions, flow directions and patterns in the aquifers
- Assess vulnerability of a proposed development to insufficient water supply by mapping / analyzing sustainable yield
- Map contributing source water areas (capture zones), which is critical for holistic management of aquifer protection, wellhead protection and ecosystem protection
- Map contamination sites, nonpoint source contamination, environmental receptors and potential impact areas of emerging contaminants
- Map aquifer recharge areas and discharge areas to assess aquifer vulnerability to surface contamination or saline upwelling, respectively

- Design monitoring well networks for sampling water quantity and quality
- Create 2D and 3D integrated overlays of raw, derived, and simulated data layers

### Root Need/Issue

The DSS tool could be valuable to the County to observe the health of the aquifers over time. It could be valuable to LUGs to predict the impact of a proposed housing development or large water demand industry in their jurisdictions on the groundwater reserves before construction is started to understand if these activities would stress the groundwater reserves and impact existing water supply. It could be valuable to assist EGLE and other agencies in responding to spills and identified contaminated groundwater spots to predict risk to public health and evaluate remediation options.

### Expected Outcome

If the interactive DSS platform were to be procured, someone would have to be trained to know how to effectively use the tool. The data would have to be updated to reflect changing conditions. The question arises as to where this responsibility for owning and operating the DSS would lie: with the County, who views the county holistically, or the LUGs, who retain authority over water regulations in their jurisdictions?

### Management/Oversight Model

Several options for management of the tool exist, including:

- County own, operate, and maintain
- LUGs own, operate, and maintain
- County owns and maintains, LUGs operate

### Funding

If procured, the DSS tool would cost approximately \$500,000. Additional funding would be needed for operation and maintenance.

### Recommendation

The WSW put a lot of consideration into this question, including analyzing input from the ACHD, Hydrosimulatics, INC and leaders of LUGs. ACHD noted that they do not have the human resources to take on this responsibility and furthermore, since the County does not have authority over water withdrawals, this tool would best be placed in the hands of the LUGs. The consensus from the LUG leadership was that such a tool seemed very useful, but they do not have the financial resources to pay for the tool, nor the human resources to operate the tool, and therefore it would best reside with the County. The DSS tool could be valuable to a county planning division, or an LUG inter-municipal planning entity. However, these oversight groups do not exist.

Therefore, the WSW recommends that the County does not pursue procurement of the integrated Decision Support System at this time.

## Acknowledgements

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The Work Group would like to acknowledge the Allegan County Board of Commissioners for providing the leadership to bring the issue of groundwater security to the forefront, for being proactive in recognizing the need to monitor groundwater quality and quantity, and for providing the members of the Work Group the opportunity to provide our expertise to contribute to the health and well-being of the county.

The Work Group gratefully acknowledges the contributions of the following staff members of Allegan County:

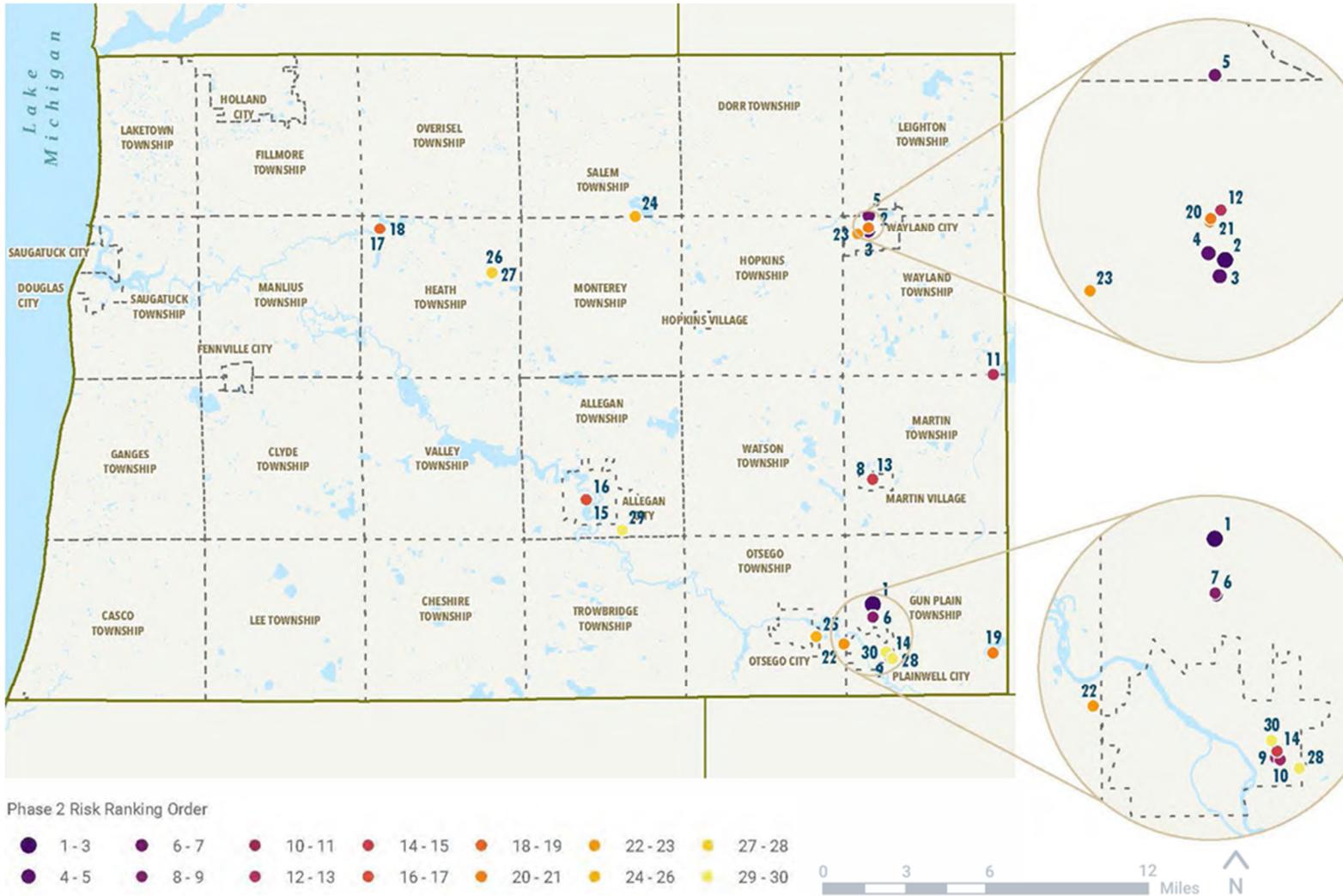
- Robert Sarro, County Administrator
- Angelique Joynes, former Health Officer
- Jacqueline Billette, Health Officer
- Steve Sedore, Executive Director of Operations
- Dan Wedge, Executive Director of Services
- Randy Rapp, Environmental Health Services Manager
- Jill Dunham, Project Manager

The Work Group wishes to acknowledge the contributions of the following outside experts:

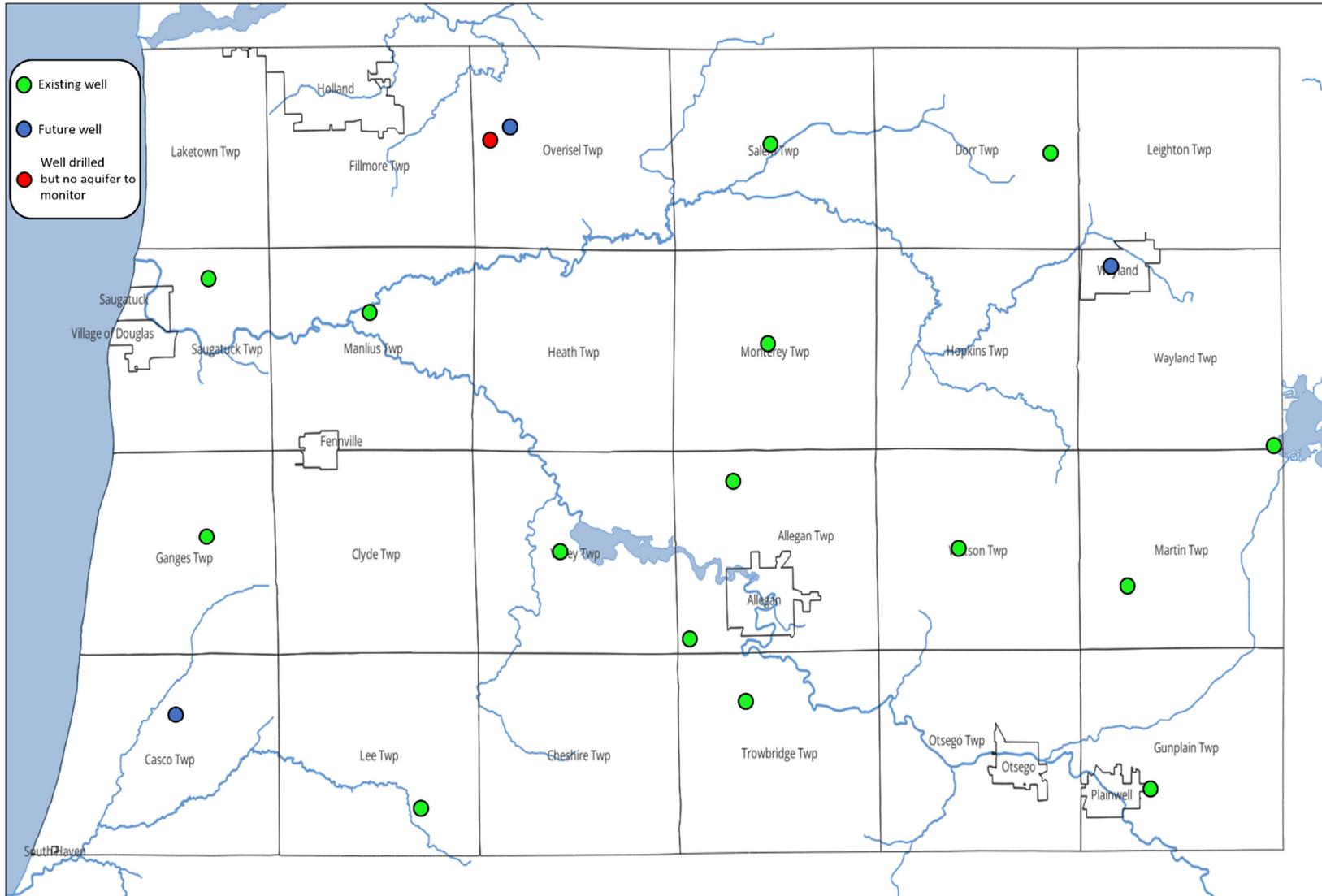
- Zach Curtis and the scientists at Hydrosimulatics, INC.
- John Yellich, Nathan Erber, and Sara Pearson of Michigan Geological Survey
- Maleah Rakestraw and Tanya DeOliveira of Williams & Works, Inc.
- Paul Sachs, Director, Department of Strategic Impact, Ottawa County

## APPENDIX A

### TOP 30 SITES OF CONCERN FROM PHASE 2 STUDY



### APPENDIX B GROUNDWATER LEVEL MONITORING WELL LOCATIONS



## APPENDIX C

### SOURCES OF DATA PRESENTED IN THE ALLEGAN COUNTY GROUNDWATER STUDIES

#### 1. GROUNDWATER ASSESSMENT REPORT

##### Glacial geology (Quaternary Geology)

- Quaternary Geology Map “draped” on 3D DEM surface with side enclosure
- Map accessible from: State of Michigan GIS Open Data portal
- [https://gis-michigan.opendata.arcgis.com/datasets/0d4a5156177a464a837830c176261e6d\\_5/explore](https://gis-michigan.opendata.arcgis.com/datasets/0d4a5156177a464a837830c176261e6d_5/explore)
- 3D rendering done with MAGNET4WATER platform: [www.magnet4water.net](http://www.magnet4water.net)
- MGS has completed an updated map that can be used by the County moving forward: <https://michigan-geological-survey-hub-wmugeography.hub.arcgis.com/datasets/b119af024e9d4148bd407314e336fccb/about>

##### Bedrock geology (subcrop) map

- Also presented in Phase 1 Report
- Map accessible from: State of Michigan GIS Open Data portal
- [https://gis-michigan.opendata.arcgis.com/datasets/d676f3f2007e4d61ad07faf0fb6bc4fd\\_0/explore?location=44.758764%2C-86.135708%2C6.93](https://gis-michigan.opendata.arcgis.com/datasets/d676f3f2007e4d61ad07faf0fb6bc4fd_0/explore?location=44.758764%2C-86.135708%2C6.93)
- 3D rendering done with MAGNET4WATER platform

##### Aquifer Yield Estimates

- Also presented in Phase 1 Report
- This is a calculated layer created by Hydrosimulatics INC. as part of the Phase 1 study

##### Long-term mean recharge

- Also presented in Phase 1 Report
- Layer originally created for Groundwater Mapping and Inventory Project (GWIM), a joint MSU-DEQ project in 2000s
- Section-based layer available from: State of Michigan GIS Open Data portal
- [https://gis-michigan.opendata.arcgis.com/datasets/104e696173d640dfbd7d957148d0b992\\_8/explore?location=42.568587%2C-85.805095%2C10.75](https://gis-michigan.opendata.arcgis.com/datasets/104e696173d640dfbd7d957148d0b992_8/explore?location=42.568587%2C-85.805095%2C10.75)

##### Flow Model results for submodels used in Groundwater Protection Area (GPA) Delineation

- Created using MAGNET4WATER groundwater modeling platform

##### Final Groundwater Protection Area Delineation

- Map created by Williams & Works; GPA shapefile created by Hydrosimulatics (GIS has been / can be made available to the County)

##### Wellhead Protection Areas – Types 1 Wells

- Layer combining WHPAs available from State of Michigan web portal (traditional or provisional WHPAs) and new WHPAs created by Hydrosimulatics INC. during Phase 2 study
- Traditional and Provisional WHPAs are available from: State of Michigan GIS Open Data portal
- [https://gis-michigan.opendata.arcgis.com/datasets/868e2d670a2641d48e0b150a84769e18\\_0/explore?location=42.707084%2C-86.089172%2C11.68](https://gis-michigan.opendata.arcgis.com/datasets/868e2d670a2641d48e0b150a84769e18_0/explore?location=42.707084%2C-86.089172%2C11.68)

### 351 sites of Groundwater Concern

- Also presented in the Phase 2 study (LUST site included)
- Sites of Environmental Concern (Part 201) are accessible from State of Michigan RIDE Mapper:  
<https://experience.arcgis.com/experience/caac24695429449bbf6cc6d89c111d3b/>
- Historical or operational landfills or waste handlers are accessible from : State of Michigan GIS Open Data portal, specific map URL: [https://gis-egle.hub.arcgis.com/datasets/9a923b49b1824f45b27a58c37526fec9\\_0/explore?location=42.917880%2C-85.983010%2C9.89](https://gis-egle.hub.arcgis.com/datasets/9a923b49b1824f45b27a58c37526fec9_0/explore?location=42.917880%2C-85.983010%2C9.89) ,  
[https://gis-egle.hub.arcgis.com/datasets/43afb115983b4c62900c7ab129e0a3e0\\_6/explore?location=42.849692%2C-85.773950%2C9.88](https://gis-egle.hub.arcgis.com/datasets/43afb115983b4c62900c7ab129e0a3e0_6/explore?location=42.849692%2C-85.773950%2C9.88) , [https://gis-michigan.opendata.arcgis.com/datasets/61be1d68d9ba43848bc2173c98836f56\\_5/explore?location=42.643792%2C-85.539004%2C10.66](https://gis-michigan.opendata.arcgis.com/datasets/61be1d68d9ba43848bc2173c98836f56_5/explore?location=42.643792%2C-85.539004%2C10.66) ,  
[https://gis-michigan.opendata.arcgis.com/datasets/eddb0a8743e640928d6a1a9fe6277b94\\_7/explore?location=42.715215%2C-85.762209%2C10.66](https://gis-michigan.opendata.arcgis.com/datasets/eddb0a8743e640928d6a1a9fe6277b94_7/explore?location=42.715215%2C-85.762209%2C10.66)
- Active (Open) Leaking Underground Storage Tank (LUST) sites are accessible from State of Michigan RIDE Mapper:  
<https://experience.arcgis.com/experience/caac24695429449bbf6cc6d89c111d3b/>
- PFAS sites: available from EGLE MPART Web Application:  
<https://egle.maps.arcgis.com/apps/webappviewer/index.html?id=bdec7880220d4ccf943aea13eba102db>

### Risk Ranking of the 351 Sites of Groundwater Concern

- This layer was created by Hydrosimulatics INC. as part of this study

### Highest Priority Sites of Groundwater Concern (Top 30)

- This layer was created by Hydrosimulatics INC. as part of this study

### Risk Ranking of Primary Non-Point Source Pollution

- This layer was created by Hydrosimulatics INC. as part of this study (spatial statistical analysis of WaterCHEM data)

### Risk Ranking of Secondary Non-Point Source Pollution

- This layer was created by Hydrosimulatics INC. as part of this study; the map was created by Williams and Works (spatial statistical analysis of WaterCHEM data)

### Graphics of “Input layers” for Composite Groundwater Risk map

- Water quality shapefile data (e.g., nitrate, chloride, etc.) are from statewide processing of WaterChem data (completed 2014); not available via a web data portal.

#### **Water Demand – Current and Future**

- **Maps were all created by Williams and Works**
- Analysis based on Wellogic water wells and typical water use rates (different sectors)
- Wellogic data can be downloaded (in bulk) from: State of Michigan GIS Open Data portal
- <https://gis-michigan.opendata.arcgis.com/search?collection=Dataset&q=Wellogic>

## **2. PHASE 2 GROUNDWATER STUDY - Screening Level Modeling, Risk Analysis, and Ranking 351 sites of Groundwater Concern**

- Also included in the Groundwater Assessment Report (see above for details)

#### **Regional and local flow fields**

- This layer was created by Hydrosimulatics INC. as part of this study (model simulations built in the MAGNET4WATER platform)

#### **Wellogic Water Well Data (Static Water Level data used for calibration of regional models)**

- Also used in Groundwater Assessment report (see above for details)

#### **Particle path “envelopes” for different travel times**

- This layer was created by Hydrosimulatics INC. as part of this study (flow-path simulations built in the MAGNET4WATER platform)

#### **Aquifer Vulnerability Map**

- This layer was computed by Hydrosimulatics INC. as part of this study (weighted spatial average of various GIS spatial layers)

## **PHASE 1 GROUNDWATER STUDY - Understanding the Big Picture**

### **(Summary and Implications document – “Story of Allegan’s Groundwater With a Focus on Management Implications”)**

#### **Glacial geology**

- Also presented in the Groundwater Assessment Report (see above for details)

#### **Bedrock geology**

- Also presented in the Groundwater Assessment Report (see above for details)

#### **Map of Water Wells (by type)**

- From Wellogic; also used in Groundwater Assessment report (see above for details)

#### **Maps of Water Wells over time**

- From Wellogic; also used in Groundwater Assessment report (see above for details)

#### **Estimate of Present-day Groundwater use**

- Computed layer based on Wellogic data and water use assumptions

**Lithology Data Use in 3D Visualization**

- Borehole lithology data available from Wellogic website:  
<https://www.michigan.gov/dtmb/services/maps/static/water-wells-by-county>
- Processing and visualization of lithology data was done using the MAGNET4WATER platform

**3D Geological Model**

- Model generated by Hydrosimulatics using the MAGNET4WATER platform
- Input data: lithologic profiles from Wellogic records

**Hydraulic Conductivity**

- Map is from GroundWater Mapping and Inventory Project, State of Michigan; not available on a web data portal.

**Bedrock Transmissivity**

- Map is from GroundWater Mapping and Inventory Project, State of Michigan; not available on a web data portal.

**Aquifer Yield**

- Also presented in the Groundwater Assessment Report (see above for details)

**Aquifer Recharge**

- Also presented in the Groundwater Assessment Report (see above for details)

**Static Water Level Temporal Trends**

- Data are from Wellogic water well records (see above for details)

**Flow patterns for the glacial aquifer**

- This layer was created by Hydrosimulatics INC. as part of this study (data spatial interpolation in the MAGNET4WATER platform)

**Flow patterns for the bedrock aquifer**

- This layer was created by Hydrosimulatics INC. as part of this study (data spatial interpolation in the MAGNET4WATER platform)

**Depth-to-water**

- This layer was computed by Hydrosimulatics INC. as part of this study

**Discharge areas**

- This layer was computed by Hydrosimulatics INC. as part of this study

**Recharge areas for the glacial aquifer**

- This layer was computed by Hydrosimulatics INC. as part of this study

**Known & Potential Sites of Contamination**

- Also presented in the Groundwater Assessment Report (see above for details)

**WaterCHEM water quality data (Nitrate, Chloride, etc.)**

- Water quality shapefile data (e.g., nitrate, chloride, etc.) are from statewide processing of WaterChem data (completed 2014); not available via a web data portal.

END