



ANNUAL REPORT OHIO-ISRAEL AGRICULTURE AND CLEANTECH INITIATIVE (OIACI) OF THE NEGEV FOUNDATION FY 2019/2020 FUNDING CYCLE

The Ohio-Israel Agricultural and CleanTech Initiative (OIACI) of The Negev Foundation focuses on promoting and enhancing trade opportunities, business attraction, technology transfer, and cooperation between Ohio and Israel in the agriculture, food, and CleanTech sectors. OIACI's goal is to enable Ohio-to-Israel export and Israel-to-Ohio business attraction and technology transfer in these sectors, enhancing business opportunities in Ohio through collaboration with Israel. OIACI pursues these objectives by working directly with Israeli and Ohio companies, participating in tradeshows, giving presentations, facilitating demonstration of company products, assisting in technology transfer, planning for and having missions and delegations between the two regions, and promoting and coordinating collaborative R&D between Ohio and Israel.

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STRENGTHEN TRADE AND BUSINESS RELATIONSHIPS BETWEEN OHIO AND ISRAEL.

Israeli Companies

BlueGreen Water Technologies

OIACI helped BlueGreen Water Technologies find a manufacturer and distributor for their product in the Cleveland, Ohio area. A local company, Superior Flux & Mfg. Co., has purchased the necessary equipment to begin manufacturing BlueGreen Water Technologies LakeGuard™ products. Pending the success of the manufacturing process, Ben Baskin, the owner of Superior Flux & Mfg. Co., plans to begin distributing and selling the product on behalf of BlueGreen Water Technologies.

Superior Flux & Mfg. Co. has begun producing both lines of BlueGreen Water Technologies products: the hydrogen peroxide-based product and the copper sulfate product. To date, they have produced and sold over \$60,000 worth of product and project sales to grow exponentially in the next 5 years. OIACI and BlueGreen Water Technologies had a call with Director Mary Mertz of the Ohio Department of Natural Resources regarding the company's potential treatment of either Buckeye Lake¹ or Grand Lake St. Mary's². Both of these lakes are historically plagued with harmful algal blooms³ that often require the Ohio EPA to issue public health advisories, warning citizens to not come in contact with the water as it could cause serious health problems.

During the call, BlueGreen Water Technologies explained to the Director how their product worked in comparison to the traditional algaecides⁴ used to treat both lakes in the past. Following this conversation, Waleed Nassar, US

¹ Buckeye Lake is a reservoir in Fairfield, Licking, and Perry counties in Ohio. The lake was created in the 19th century as the "Licking County Reservoir", an important part of the Ohio and Erie Canal project. In 1949, Buckeye Lake was named a state park.

² Grand Lake is the largest inland lake in Ohio in terms of area and located in Mercer and Auglaize Counties. Due to increasingly high levels of lake pollution, E. coli bacteria, and related algal levels, Grand Lake is considered "impaired" by the Ohio EPA due to "stream channelization, drainage tiles, loss of floodplains and streamside vegetation, manure runoff and untreated sewage flowing from failing home septic systems and small communities without any wastewater collection or treatment."

³ Harmful algal blooms, or HABs, occur when colonies of algae – simple plants that live in the sea and freshwater – grow out of control and produce toxic or harmful effects on people, fish, shellfish, marine mammals, and birds.

⁴ A chemical substance for killing and preventing the growth of algae.

Director of Operations for BlueGreen Water Technologies, had a one-on-one conversation with Director Mertz to discuss the feasibility of such a project. OIACI believes that, come this spring, BlueGreen may be treating one if not both of these bodies of water for harmful algal blooms.

In addition, there was discussion of BlueGreen Water Technologies treating Crane Lake, a smaller body of water connected to Buckeye Lake, as a test area for their product before treatment of the much larger Buckeye Lake.

IOSight

IOSight has been very active within the state of Ohio; a summary of their activities includes the following:

Development of an integrated data management system and analytics for water quality monitoring in Lake Erie and surrounding rivers

- On-going collaboration with Laura Tegethoff of 360Water to promote and develop this initiative
- Multiple meetings and discussions with Cleveland Water Alliance including an outlined proposal related to CWA Citizen Science initiative
- A meeting with Joy Mulinex, Director of Lake Erie Commission – arranged by Sarah Horowitz
- A meeting with the Ohio EPA

Discussions with Utilities

- Meetings with Montgomery County water and wastewater management + hosting their delegation in Israel – supported by DRITA
- Meetings with Dayton water department – facilitated by DRITA
- A meeting with Cleveland Water to discuss opportunities for installation of the iGreen data management solutions and the iWT algorithm-based optimization solution for water treatment plants – with OIACI participation
- A meeting with Columbus Water at Dublin Road Water Plant – arranged by Laura of 360Water

Other

- Preparation and submission of a proposal to BIRD Energy in partnership with Grid Sentry from the Dayton region (connection made by DRITA)

- Watec 2019 - Inviting and hosting Laura Tegethoff (360Water) and Bryan Stubbs (CWA)
- A meeting with David Silk from Akron to discuss future direction for business development (original connection made by Sarah Horowitz).

Fluence

In early February 2020, OIACI and the Negev Foundation had a discussion with Ronen Barken, the North America Sales Manager for Fluence Corp, about the possibility of working on two separate decentralized wastewater treatment⁵ projects. Both of the towns Southington⁶ and Bloomfield⁷ are rural communities that lack access to a centralized wastewater treatment facility⁸. Ronen expressed great interest in such an opportunity. He mentioned that Fluence could do either a large-scale centralized system or decentralized systems made up of pods of 5 to 7 houses. To learn more about this project please read the Southington and Bloomfield, Ohio section under Extended Partnerships to Meet Ohio-Specific Needs through Field Trials and Pilots header.

E.P.C. Ltd.

In early March, the OIACI Program Director reached out to Lior Ditur, the Process Engineer for E.P.C. Ltd., regarding the aforementioned Bloomfield and Southington project. The advantage of working with E.P.C. Ltd. for this project is that they have technology available that would allow them to upgrade existing septic systems so that they comply with Ohio EPA regulations.

In addition, they have two separate decentralized wastewater treatment options that could be applicable to the region. Lior suggested their Rotating Biological Contactor (RBC), a fixed biological film (bio-film) reactor system, as it is one of the most efficient wastewater treatment technologies. The advantage of the RBC is its relatively low energy consumption, simple

⁵ Decentralized wastewater treatment systems convey, treat, and dispose or reuse wastewater from small communities, buildings, and dwellings in remote areas, individual, public, or private properties.

⁶ Southington is an unincorporated community in central Southington Township, Trumbull County Ohio.

⁷ North Bloomfield is an unincorporated community in the central Bloomfield Township, Trumbull County, Ohio.

⁸ Centralized wastewater treatment systems are most widely applied in well-developed urban environments. They collect water in large pipeline networks, which transport it at long distances to one or several treatment plants.

operation and maintenance, and successive treatment of the influent contaminants.

Groundwork BioAg

Beginning in March of 2020, OIACI has had several conversations with the company Groundwork BioAg regarding potential projects, partnerships, H2Ohio, and several other topics⁹. OIACI initially contacted the US Representative for Groundwork BioAg— John Buck of Buck Farms— to discuss projects with Groundworks' patented mycorrhiza¹⁰ that would involve a few farms in the Maumee River Watershed. John informed OIACI that he is already working with some farmers in the area and would love to extend his reach and partnerships in that area.

As part of the H2Ohio funding, specifically the portion that was distributed to the Ohio Department of Agriculture, farmers may apply for funding to help them meet the ODA's best management practices¹¹ for farms in the Maumee Water Basin. In total some \$50 million will be available to the nearly 2,000 farmers that submitted applications to enroll more than 1.1 million acres in the Maumee River Watershed. OIACI is looking to work with farmers or farm bureaus in the area to develop a project that will highlight Israeli technology. OIACI is working with John to find farmers in the area that would be willing to use a few acres on their farm to grow hemp using a type of Groundwork BioAg mycorrhiza that is specifically formulated for cannabis growth.

Furthermore, John Buck is partnering with an Ohio company, 3Bar Biologics, which is based out of Columbus, Ohio. The two companies, 3Bar and Groundwork, are working together to create one product that contains both of their innovative technologies. 3Bar Biologics is a cutting-edge biotech company that helps the agricultural value chain optimize their solutions for improving quality and quantity of crop production. 3Bar's proprietary delivery method grows fresh microbes on-site to ensure farmers have the most viable

⁹ Please see Appendix A for more information regarding OIACI's H2Ohio Plan.

¹⁰ There are many types of "good" fungi that form symbiotic (mutually beneficial) relationships with plants. These relationships are known as mycorrhizae, and the microorganisms are called mycorrhizal fungi. These specialized fungi effectively extend the plant root system with mycelium – a web of long microscopic filaments called hyphae.

¹¹ The 10 best practices that are cost-effective and proven to work include: soil testing, variable rate fertilization, subsurface nutrient application, manure incorporation, conservation crop rotation, cover crops, drainage water management, two-stage construction, edge of field buffers, and wetlands.

and abundant microbes at the time of application. When 3Bar's and Groundworks' technologies are combined, a farmer will get the most out of the first 30 days of the growing cycle due to the microbes from 3Bar. After the 30-day period that it takes for the mycorrhiza to be established, the crop will continue to have increased yields, lower fertilizer requirements, and increased nutrient uptake from the root system.

Israeli Government

Israel Economic Mission to the East Coast, Foreign Trade Administration at the Israeli Ministry of Economy

The Israeli Foreign Trade Administration at the Ministry of Economy is responsible for managing and directing the international trade policy of the State of Israel. The main fields of activity include the promotion of trade and export, initiating and maintaining trade agreements for the improvement of Israel's trade conditions, attracting and encouraging foreign investments, and creating strategic cooperation with foreign companies.

OIACI, the Negev Foundation, and the Economic Mission have regular calls to discuss synergistic partnership opportunities that may exist. The Economic Mission also regularly recommends companies in OIACI's designated areas of focus that would be a good fit for the state of Ohio. Following these recommendations, OIACI properly vets the companies to make sure they fit with OIACI's mission & objectives. If they do, the technology is then introduced to the appropriate parties within the state.

On June 15th, 2020 the Government of Israel Economic Mission hosted a special virtual water webinar featuring four Israeli water technology companies, IOSight¹², IXDen¹³, Newsight Imaging¹⁴ & CQM¹⁵; David Balsar, Mekorot's General Manager of Innovative & Ventures; and Barbara Martin, American Water Works Association's Director of Engineering & Technical Services. OIACI was instrumental in helping the Economic Mission find the

¹² IOSight offers an end-to-end data management and analytics solution – from data foundation through business intelligence outputs to advance analytics and decision support algorithms.

¹³ IXDen guards against threats such as sensor data manipulation, data injection, sensor software tampering, sensor hardware tampering, and sensor replacement.

¹⁴ Newsight Imaging develops advanced complementary metal oxide semiconductor image sensor chips for several industries.

¹⁵ CQM develops environmentally-friendly solutions that keep heat exchanger and cooling towers clean and continuously efficient.

companies to participate in the webinar. The OIACI Program Director sent Jacob Bassiri, OIACI's point of contact at the Economic Mission, a list of companies that she thought would be a good fit for such a webinar. She provided their company profiles, as well as the contact person for each company. In addition, the OIACI Program Director provided a list of important individuals that the Initiative has worked with and currently works with that Jacob might be interested in inviting to participate in the webinar audience.

New Companies

Woosh

The company produces smart water stations that provide ultra-purified, ice-cold water on the go and in public spaces. The stations fill any type of bottle with filtered water, using their patented O₃ technology that removes impurities and keeps "the good stuff" in the water via an eco-friendly process.

They offer a new model that is specifically designed with schools in mind, dealing with lead contamination that may be present in schools and daycares. According to the EPA & WHO, lead is a significant concern for the growing bodies of children and infants, as they absorb more lead than the average adult. Woosh developed a multi-tap system that is designed to remove lead from drinking water in schools and childcare facilities but still allows for up to 4 individuals to use the one station at a time, as it has a very high refill rate, at 20 fills per minute.

The OIACI Program Director has had several calls with Ohad Maimon, the Marketing Manager for The Woosh Team. During these calls, the OIACI Program Director discussed the opportunities that exist within the state of Ohio for Woosh, especially due to the Governor's H2Ohio Plan. Currently, OIACI is in the process of developing a scaled demonstration that includes Woosh technology, which will be a part of OIACI's H2Ohio portfolio.

Updates:

Per a grant from the Cleveland Foundation, OIACI and The Negev Foundation are looking to put together a demonstration with Woosh, the Cleveland Metropolitan School District and the Mt. Sinai Foundation to put 3-

5 of Woosh's systems into schools in Cuyahoga County. In addition, Woosh has added specific COVID-19 related protocols to their systems, including touchless filling and increased sanitation, continuing the allowance of social distancing. To learn more about this project please read the *Woosh and Cleveland Metropolitan School District* section located under the *Extended Partnerships to Meet Ohio-Specific Needs through Field Trials and Pilots* header.

Elgressy

With a patented and innovative electrochemistry, electrocoagulation, and electro-oxidation technology at its core, Elgressy developed groundbreaking, chemical-free water treatment solutions for industrial, commercial, and municipal applications.

Representative Gil Blair of Trumbull County approached the Negev Foundation President, Sam Hoenig, and asked him if Israel had any solutions to fracking wastewater and injection wells. While hydraulic fracturing is not done actively in Israel, OIACI and the Negev Foundation began searching for a company that might be able to treat the chemicals that are found in fracking wastewater. Elgressy was recommended to OIACI by the Israel Economic Mission as a company that might be able to address the issue.

While Elgressy does not actively have a solution for treating hydraulic fracturing wastewater, they are willing to attempt a solution. The OIACI Program Director sent an analysis of a fracking wastewater spill that happened in Trumbull County in 2015, which had a great impact on water sources directly near the spill. OIACI and Elgressy are currently discussing the possibility of Elgressy treating this type of wastewater.

SyrinJector

SyrinJector Ltd. aims to support and strengthen the Production Animal Industry by introducing unique, smart electronic syringes for use on cattle, pigs, sheep, goats, and poultry. The syringe offers operational diversity for single or double vaccinations at a time, through a single or double needle injection unit. The SyrinJector unit is programmable and monitored by an app on a smart phone or computer. It is an automated, portable, electronic unit that provides accuracy, sterility, and accountability as well as increases safety for the operator and improved welfare for the animals involved.

OIACI and the Negev Foundation have been in touch with Nadav Galon, Chairman of SyrinJector Ltd., several times to discuss the potential of introducing his technology to the US. They are currently in the research and development phase, and will be ready later this year to introduce their product to the international market. OIACI is looking to introduce this technology to the large agricultural industry within the state of Ohio and introduce it to veterinarians around the state who may be the ones administering the shot itself.

Updates:

OIACI spoke with Tim Derrickson, the Associate Director of the Ohio Department of Agriculture, about this innovative product. Tim was excited about the potential this product held for the extensive dairy industry in the state of Ohio. In addition, on May 13, OIACI had a conference call with the Director of the Ohio Department of Agriculture, Dorothy Pelanda, to discuss potential H2Ohi-related projects and additional funds that may exist within the department for scaled demonstrations. One of the technologies that OIACI introduced Director Pelanda to was SyrinJector's.

Ayala Water & Ecology Ltd.

Ayala is a company of sustainability experts with 26 years of experience in the field of phytoremediation who operate with a very simple goal: use natural, energy free, tools to restore balance to the environment. This goal led to the development of the Natural Biological System™, a sustainable natural technology for treating sewage and waste streams, rehabilitating affected water bodies and rebalancing watersheds.

Two of the areas that H2Ohio is working to address include the reestablishment of wetlands¹⁶, as well as nutrition runoff reduction. We are working with Ayala to see if it would be possible to use their system as a buffer between farms and bodies of water, such as the Maumee River. The Natural Biological System™ could act as a natural filter for all the nutrient runoff that comes off fields during heavy rainfall and irrigation. In addition, establishing buffers is one of the Ohio Department of Agriculture's 10 best management practices for farms.

¹⁶ Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season.

IDE Technologies

IDE specializes in the development, engineering, construction, and operation of enhanced desalination and industrial water treatment plants. They produce some of the world's most advanced thermal and membrane desalination plants. They provide small to large cost-effective desalination solutions, such as IDE PROGREEN™, a modular, chemical-free reverse osmosis 'plant in a box.' IDE has proven experience in ground-breaking industrial water treatment plants that deliver a reliable, sustainable, and economical solution across all industries.

IDE proved to be a very useful contact regarding the treatment of fracking wastewater. This issue was originally brought to OIACI's attention by Representative Gil Blair, who was worried about the injection wells that are located in his district and the effects they were having on water and soil in the county. Due to IDE's superior technologies in the filtration of seawater and other brackish waters, we posed the question of treating fracking wastewater to them. As fracking is not done in Israel, they had to do some research on their end in order to test the feasibility of such a project. OIACI sent them a chemical breakdown from a fracking wastewater spill that happened in Trumbull County a few years ago so they would better understand the chemicals they were dealing with. IDE is currently analyzing the data sent to them by OIACI to better understand if they can in fact treat the chemicals present in the wastewater.

H+ Solutions

H+ Solutions has developed a fracking wastewater treatment process that:

- Aims to recover valuable components present in the wastewater in saleable form.
- Has Israeli AMS nanofiltration (NF) membranes as the core process to separate multi- and monovalent components
- Employs other separation and extraction technologies (ion-exchange, selective precipitation, crystallization, etc.) to process NF effluent streams.
- Can be easily adapted to accommodate treatment of streams from similar operations. Extraction system can be customized to produce different products suitable for particular case.
- Has short (<1 year) payback period.

OIACI sent Ilya Krougly of H+ Solutions a copy of an ODNR study which focused on surface water sources following a fracking wastewater spill in 2015. H+ Solutions is analyzing the data which includes a long list of chemicals that were found present in water sources following the spill. Our hope is that H+ Solutions will be able to filter out the extremely dangerous chemicals to avoid any adverse human health effects, environmental degradation, as well as avoid any further consequences to the environment when the wastewater from hydraulic fracturing is put into injection wells in the future.

MemTech – Advanced Membrane Technologies

MemTech is an Israeli company that develops membranes for wastewater treatment, with ultra-high fluxes that dramatically reduce the cost of both CapEx¹⁷ and OpEx¹⁸ in water and wastewater treatment. They focus most of their resources on R&D, and work together with a few strategic partners: the Technion— Israel's biggest R&D institute, Mekorot— Israel's national water carrier, Arkema— one of the biggest membrane's polymer manufacturers in the world, and Group SEB.

OIACI is currently working on several projects that involve the need for decentralized wastewater treatment systems for rural communities. Two examples include the cities of Southington and Bloomfield, located in Trumbull County. Both are very small cities that do not have access to a central wastewater treatment plant; therefore, every home has its own septic system. Most of these septic systems are out of date or out of compliance with Ohio EPA regulations and require replacement. OIACI is hoping that MemTech may be one of the companies selected to replace these failing septic systems with decentralized, pod-like wastewater treatment systems.

Water Flow Tech

Water Flow Tech specializes in smart water IoT technology¹⁹, focused in low flow controllers that detect and alert low flow water leaks in real time saving

¹⁷ CAPEX refers to a capital expense, it is an expense a business incurs to create a benefit in the future.

¹⁸ OPEX is an operating expense, is an expense required for the day-to-day functioning of a business.

¹⁹ IoT technology can be used to monitor rivers, lakes, watercourses, wells and boreholes – ensuring that the water is suitable for human or animal consumption.

water loss and preventing physical and financial damages. Their end clients are water utilities and water companies.

Recently, we completed a project with the leak detection company Utilis and Cleveland Water. Utilis encountered a few unforeseen issues, namely with salt build up on pipes; as this is not a practice used in Israel, the company had not previously encountered such a problem. Therefore, after the 3 trials, all with varying results, Utilis went back to the drawing boards to try to address this issue for future testing.

In the meantime, OIACI thought that it might be beneficial to have other leak detection company, Water Flow Tech, to do a scaled demonstration on water lines in the city of Cleveland, to compare their results with Utilis'. Doing a compare and contrast study, allowing for analysis that will great a "best end result" for Cleveland Water and allow them to have a much more holistic representation of leaks and potential leaks in their water lines.

WFI & Subsidiaries

WFI Group offers comprehensive water treatment and reuse solutions based on their proprietary cutting-edge technologies. They deliver high-quality, clean water for a variety of purposes, bringing peace of mind and value to agriculture, cities, municipalities, decentralized communities, and industrial plants.

The company comprises 4 business units providing a range of water treatment solutions, from high-recovery membrane desalination²⁰ through simple-to-operate biological waste water treatment to selective removal and recovery of inorganic pollutants²¹ from different water sources.

ROTEC

²⁰ Desalination is a process that takes away mineral components from saline water. More generally, desalination refers to the removal of salts and minerals from a target substance. Saltwater is desalinated to produce water suitable for human consumption or irrigation. The by-product of the desalination is brine.

²¹ Inorganic pollution are things found naturally but because of human production of goods have been altered to drastically increase the amount of them in the environment (some examples include arsenic, lead, as well as many different air pollutants).

ROTEC offers ultra-high reverse osmosis (RO) desalination²² solutions via their proprietary Flow Reversal technology. By enhancing recovery and plant efficiency, minimizing brine, and improving operational reliability, their solutions dramatically increase production, decrease costs, and minimize eco-footprint, providing customers with a risk-free solution and enduring peace of mind.

Triple T

Triple T solutions are based on their proprietary TAYA technology, they offer simple, cost-effective, and sustainable solutions that solve the substantial regulatory and cost challenges of wastewater treatment. By dramatically reducing sludge handling, labor requirements, energy consumption, and eco-impact, their solutions transform biotreatment of wastewater from a burden into the double asset of clean effluent and near-zero cost.

ToxSorb

ToxSorb offer a cost-effective, environmentally sound way to selectively remove inorganic contaminants from groundwater and industrial water with extraordinary precision. Using their innovative proprietary MAC technology, which catalytically breaks down specific pollutants such as perchlorate, chromium, and cyanide, their solutions achieve non-detect levels. Additionally, they enable near – Zero Liquid Discharge (ZLD) wastewater treatment for industrial wastewater recycling.

AST

From process engineering, purchasing, and construction to commissioning, operations & maintenance (O&M), support, and comprehensive turnkey project management, AST addresses a wide range of needs. They offer fast and flexible solutions that solve complex challenges and add value to water, maximizing return on customers' investment.

Applications of Technology

WFI Group's subsidiary companies hold a lot of potential in addressing several environmental and water issues in the state of Ohio. Specifically, ToxSorb and Triple T are both applicable for decentralized communities with failing septic systems that are in need of updated wastewater treatment.

²² In the reverse osmosis process, water from a pressurized saline solution is separated from the dissolved salts by flowing through a water-permeable membrane.

Their solutions allow each system to be customized to fit customers' needs and address the community's concerns. OIACI is working with two decentralized communities, Southington and Bloomfield, to address this very issue of failing septic systems and potential solutions. OIACI is exploring the possibility of using Triple-T's or ToxSorb's technologies as a potential solution to the wastewater issues found all over the state. In addition, ROTEC's technology may be used to treat fracking wastewater as a solution to the problems in Trumbull County with injection wells.

NUFiltration

NUFiltration's patented and innovative product the NUF technology was developed to address needs in the water and wastewater treatment sectors. NUF is a new revolutionary way to filter and sanitize water in one sole and unique pass, at an extremely competitive cost. Pathogens, parasites, bacteria, suspended solids, most of the organic matters and most viruses are retained from permeating the membrane thanks to the excellent and almost unbeatable membrane surface quality and accuracy, which was originally designed, manufactured, and tested according to the strictest medical standards.

NUFiltration designs, builds, and supplies engineering plants embedded with the NUF technology for the purification of surface water, the upgrade of secondary effluents, the premium treatment of swimming pool water, the recycling of irrigation water in greenhouses, and for tens of other applications in the water industry.

When OIACI met with ODNR Director Mary Mertz, OIACI posed the idea of putting efficient and updated wastewater treatment solutions at often overlooked locations, like rest stops, gas stations, and small decentralized communities. NUF technology is perfect for these types of locations, as the system is compact, highly advanced, and designed to handle the wastewater sources produced at such locations. NUFiltration originally reached out to OIACI following the WATEC conference that our Israeli Consultant, Josh Brooks, attended in OIACI's place.

Lishtot

Lishtot's proprietary technology platform uses electric field sensors to determine the profile/quality of a given water sample. Their technology is

premised on fundamental chemical principles; the interplay between water and a testing cup generates a distinctive electric field. Contaminants present in the water will cause interference, leading to the creation of a distorted electric field. These field distortions will vary depending on the type of contamination in the water, whether from bacteria, organics, heavy metals, pesticides, or toxins.

Their sensors can determine the quality of the water by the nature of the electric field measured around the cup. The sensors record a result on the device, signaling the result with a red or blue light, and send the data to the Lishtot mobile app. The technology is sensitive to anything that is not supposed to be in the water; however, the technology is not disrupted by the presence of substances that are supposed to be in clean water, such as soil, salt, and magnesium. Default devices are calibrated to World Health Organization guidelines for drinking-water quality but can be adjusted individually through the app to different levels of water quality.

Per the Governor of Ohio's H2Ohio program, lead and other contaminants found in water sources was one of his biggest concerns. Lishtot offers a simple and easy-to-use solution and allows users to quickly and effectively know the quality of bottled, tap, or natural water sources. The device is handheld and so small that it can be attached to users' keys, offering increased accessibility.

Kenaf Ventures

OIACI has been a part of several conversations in the Trumbull County/Warren area regarding growing hemp and other high value crops. Some examples of how these high value crops could be grown include an agriculture co-op on an industrial scale, or in an indoor greenhouse.

OIACI reached out to Kenaf Ventures, an Israeli company that has experience working with hemp, but specializes and focuses on the development of products that are based on the Kenaf²³ plant. Asaf Ofer, the CEO & Co-Founder of Kenaf Ventures, spoke to the benefits of Kenaf vs. hemp in stating that Kenaf is superior to hemp in terms of heavy-duty and

²³ Kenaf is a fiber plant native to east-central Africa where it has been grown for several thousand years for food and fiber. It has been a source of textile fiber for such products as rope, twine, bagging, and rugs. Kenaf is a promising source of raw material fiber for pulp, paper, and other fiber products.

technical applications, which are two industries with the greatest impact on pollution, which Kenaf is working to address.

Their first project included a partnership with Netafim²⁴, another of our Israeli partner companies. They were working together to reduce 50% of plastic consumption in their products and Kenaf Ventures was tasked with helping them to find a solution.

Kenaf was not previously a crop that OIACI had thought to introduce into this agricultural project; however, following a conversation with Kenaf Ventures and realizing the overall value and benefits that Kenaf could bring to Ohio, this crop will likely be included in the agricultural hub project taking place in Trumbull County.

Bottz Natural Building Materials

OIACI contacted Bottz Natural Building Materials, an Israeli company, that specializes in the field of natural building and promotes and leads in Israeli wall systems for houses made of natural materials. They focus on making natural building materials more accessible for local contractors. They conduct most of their building projects with a product known as hempcrete.

Hempcrete is comprised of hemp hurds, or the center of the stalk, water and lime (which is powdered limestone). It weighs about 1/7 or 1/8 of the weight of concrete, making it a much easier building material to work with. It is highly flame-resistant, extremely resistant to fungus, and also has anti-microbial properties. Due to its porous nature, it can store a large amount of moisture without causing any damage to the structural integrity of the building. Hempcrete works great as insulation in both hot and cold climates, it is a non-toxic material, and it is entirely biodegradable, making it both recyclable and reusable.

OIACI wishes to use the expertise and knowledge of individuals at the Bottz Natural Building Materials as consultants on the Trumbull County agriculture project, or perhaps import some of the natural building materials or hempcrete for use in the same project.

²⁴ Netafim is an Israeli manufacturer of irrigation equipment. The company produces drippers, dripperlines, sprinklers, and micro-emitters. Netafim also manufactures and distributes crop management technologies, including monitoring and control systems, dosing systems, and crop management software.

Tav Group

The Tav Group is a unique natural design architecture firm with many projects across Israel. They import industrial cannabis from Spain to use for materials in their natural design projects. In 2017, they designed and built a house in Ein Hod using hempcrete— the first house of its kind in Israel. They mixed hemp with local limestone to build the walls, and the all-natural insulating materials can conserve up to 50% of the energy needed for cooling. In 2018, the Tav Group designed 3 more homes using this same building technique.

The Tav Group was one of the first companies in the world to introduce natural building materials into homes at such a scale. They would serve as great consultants on OIACI's agricultural project in Trumbull County. In addition, the Tav Group could be tasked with designing the overall agricultural hub space making it a sustainable space from these crops to be grown with CleanTech technologies and through sustainable farming practices.

COORDINATE EVENTS TO CONNECT INDUSTRY PROFESSIONALS.

WATEC

Date: Monday, November 18 – Thursday, November 21

The focus of WATEC 2019 was “Water Stewardship and Innovation – driving global leadership in the responsible planning management, and protection of water.”

The conference included:

- Interactive experiences with water technology ingenuity
- Start-Up Culture— meet the people behind the ideas
- Networking and brainstorming on water issues and technologies as they develop
- Meet the next-generation of water developers.
- True water technology development

OIACI and the Negev Foundation sponsored Bryan Stubbs, Executive Director of the Cleveland Water Alliance, so that he was able to attend the conference. His land expenses were covered by a stipend donated by the Negev Foundation. Bryan was invited to speak at the conference and to

participate as a panelist at various roundtables. Laura Tegethoff Raish of 360Water, a partner of the Initiative, also participated in the WATEC conference.

OIACI and the Negev Foundation also covered the expenses of our associate Josh Brooks so that he was able to attend the conference. During his time at the conference on Tuesday, November 19th, he attended the opening ceremony, remarks, and keynote speaker Andrew Wheeler's talk. Additionally, Josh went to the roundtable discussion on "Innovation in Drinking Water," which included panelists that were partners of OIACI, Laura Tegethoff Raish from 360Water, and Natan Zuta from IOSight. He also attended the roundtable discussion that Bryan Stubbs was a part of titled "Disruptive Innovation in Monitoring"; Natan Zuta from IOSight was also a panelist. On Wednesday, November 20th, he attended the opening keynote speech by Jay Famiglietti who is a member of the Global Institute for Water Security, as well as a roundtable discussion on "California's Path to Water and Energy Resilience: Innovation and Collaboration."

Josh also took time to meet with several companies during his time at WATEC, including IOSight, Lishtot, Elgressy Engineering, Water Flow Tech, 360Water, Cleveland Water Alliance, HP Now, Ayala, Maagan Filtration, UET, Aqwise, Nufiltration, Utilis, Fluence, Tevet Water Technologies, Wint, Amiad Water Systems, Woosh, and Ever Clear.

For further information on these companies, please feel free to visit their websites:

IOSight - <https://iosight.com/>

Lishtot - <https://www.lishtot.com/index.php>

Elgressy Engineering - <https://www.elgressy.com/>

Water Flow Tech - <https://www.wft.co.il/>

360Water - <https://www.360water.com/>

Cleveland Water Alliance - <https://clevelandwateralliance.org/>

Ayala Water & Ecology - <http://www.ayala-aqua.com/>

Maagan Filtration - <https://www.maaganfiltration.com/>

UET - <https://www.uet.co.il/>

Aqwise - <http://www.aqwise.com/>

Nufiltration - <https://www.nufiltration.com/>

Utilis - <https://utiliscorp.com/>

Fluence - <https://www.fluencecorp.com/>

Tevet Water Technologies - <http://www.tevetwater.com/>

Wint - <https://wint.ai/>

Amiad Water Systems - <https://www.amiad.com/>

Woosh - <https://www.wooshwater.com/>

Growing Hemp in Ohio

January 24, 2020 | 8:30 am – 5:00 pm

OARDC/OSU, 1680 Madison Avenue, Wooster, Ohio

Agenda:

Industrial Hemp and Cultivation Practices

- Understanding Hemp – Craig Schluttenhofer, Central State University
- Insect Control – Luis Canas, Ohio State University
- Soil Nutrition Fundamentals – Steven Culman, Ohio State University
- Using Plasticulture, Drip Irrigation, and Fertigation – Brad Bergefurd, Ohio State University
- OSU Research Update – Harold Keener, James Morris, and Bill Bauerle, Ohio State University

The Business of Growing Hemp

- Ohio Rules and Regulations – David Miran, Ohio Department of Agriculture, Hemp Program
- Market Perspectives – Jonathan Cachat, Zativa
- Protecting Your Investment: Legal Issues – Peggy Kirk Hall, Ohio State University
- Grower's Perspective – Steve Ayers, Acela CBD-Ohio
- Roundtable: Separating Fact from Fiction – Julie Doran, Ohio Hemp Farmer Cooperative, and previous speakers

The OIACI Program Director attended this conference which was organized by and hosted at OARDC, the research arm of OSU. During the conference, the OIACI Program Director was able to introduce herself to Brad Bergefurd, Gary Pierzynski, as well as several farmers from around the state of Ohio that are interested in growing hemp during the 2020 grow season. The OIACI Program Director has reached out to the OARDC event organizers to get the participant list in order to follow up with the appropriate individuals for potential partnerships in future on hemp-related projects.

As this is a new field for OIACI and the Negev Foundation, further research is necessary, as well as partnerships with experienced growers that would be able to showcase the amazing Israeli technology specific to cannabis growth.

Cannabis growth and research is a massive field within the state of Israel and they are at the forefront of developing new and innovative grow techniques, technologies, and types of hemp that are best suited for certain soil types. OIACI is looking to bring some of that knowledge over to Ohio, as it is a new crop to the state and a potentially massive economic stimulant for the economy.

OIACI North Coast of Ohio Water Conference

OIACI and the Negev Foundation are planning to host a North Coast of Ohio Water Conference that will take place in early 2021. They are currently in the planning stages which include putting together a planning document and finding partners and sponsors. They have been in touch with the Israeli Consulate in New York City and the Israeli Economic Mission to learn more about similar types of programs that have happened elsewhere in the United States. The Economic Mission has co-sponsored a roadshow which included several Israeli companies traveling across several states to showcase their technologies and systems. The states that have participated in a similar showcase include Arizona, Texas, California, and Maryland.

This conference would include partners such as TMACOG and Cleveland Water Alliance (CWA). It would namely focus on Lake Erie, the issues that have been presented there, and Israeli technologies that can be used to address issues directly related to Lake Erie. In addition, the Maumee Water Watershed is an area of the state with a host of issues that several Israeli technologies could be used to address.

FACILITATE RESEARCH AND DEVELOPMENT PARTNERSHIPS.

Toledo, Ohio

Senator Gavarone

On January 13th, 2020, OIACI was invited to attend a meeting at the Jewish Federation and Foundation of Greater Toledo to discuss potential projects in the area that address many of the issues H2Ohio hopes to solve. The OIACI Program Director gave a 15-minute presentation to:

- Senator Gavarone, Senate District 2
- Stephen Rothschild, Executive Director of the Jewish Federation and Foundation of Greater Toledo
- Howie Beigelman, Executive Director of Ohio Jewish Communities
- Rich Rusgo, President of the Jewish Federation and Foundation of Greater Toledo
- Laurie Gross, Vice President of the Jewish Federation and Foundation of Greater Toledo
- Mark Greenblatt, Treasurer of the Jewish Federation and Foundation of Greater Toledo

The OIACI Program Director spoke on issues such as harmful algal blooms (HABs), decentralized wastewater treatment, nutrient runoff, and lead contamination. The Senator stated that she is very interested in a few of the technologies, namely BlueGreen Water Technologies, which addresses harmful algal blooms, and Fluence, a company that focuses on decentralized wastewater treatment. She will be in touch with OIACI to discuss the potential projects in the area.

Toledo Metropolitan Area Council of Governments (TMACOG)

TMACOG is a non-partisan regional planning partnership made up of voluntary members in northwest Ohio and southeast Michigan. Together, the members work on transportation and water quality, showing support for regional economic development endeavors that affect quality of life for everyone in the region.

OIACI has worked very closely with Tim Brown, President of TMACOG, and Kari Gerwin, Director of Water Quality Planning, to plan the water mission that was scheduled to take place in May of 2020 and has been rescheduled for May 2021. They have also been instrumental in helping OIACI develop the scaled demonstrations which are a part of their H2Ohio funding proposal.

OIACI continued to work with TMACOG in their efforts to find potential H2Ohio scaled demonstration sites. Kari Gerwin referred Roland Southard, the Trustee, Treasurer, and other Special Projects Coordinator for the Williamsburg on the River Homeowners Association to OIACI. The Williamsburg on the River

HOA has an impoundment²⁵ located on their land and were looking for a solution to the algal bloom issues they were having with the body of water. OIACI referred the project to BlueGreen Water Technologies to gauge their interest in such a project and put Waleed from BlueGreen Water Technologies in touch with Roland Southard.

Tim Brown suggested Maumee Bay State Park²⁶ as a potential demonstration site for our H2Ohio Initiative, as the park is known to suffer from algal blooms. The park suffers from blooms caused by two different sources, which include waste that is causing E. coli²⁷ outbreaks at the inland beach and nutrition runoff that is causing harmful algal blooms on the Lake Erie beach. To learn more, please read the Maumee Bay State Park section located under the Extended Partnerships to Meet Ohio-Specific Needs through Field Trials and Pilots header.

Jewish Federation & Foundation of Greater Toledo

OIACI, The Negev Foundation, and the Jewish Federation & Foundation of Greater Toledo worked to plan and sponsor a water mission to Israel that was scheduled take place in May 2020. During the initial planning of the mission, the participants were planning on attending the WATEC conference that would be taking place in Israel during the mission. The mission was originally planned for November, but due to a request directly from the Jewish Federation needing to focus all their fundraising at the end of 2019 on security issues, the fundraising efforts for the mission had to be postponed and so did the mission itself. With the shared goal of improving water quality in the state of Ohio and the Western Lake Erie Basin specifically, OIACI and The Negev Foundation are planning a professional development opportunity for individuals from the Toledo area.

The participants that have signed letters of intent to partake in the mission are as follows:

- Dr. Thomas Bridgeman, Director of the University of Toledo – Lake Erie Center
- Tim Brown, President, Toledo Metropolitan Area Council of Governments (TMACOG)

²⁵ An impoundment is the result of a dam, creating a body of water. A reservoir, formed by a dam. It can be built to stop water runoff.

²⁶ Maumee Bay State Park is a state park in Jerusalem Township, Lucas County, Ohio. The park was acquired by the state in 1974 and became a state park in 1975.

²⁷ E. coli is a type fecal coliform bacterium that is commonly found in the intestines of animals and humans. E. coli in water is a strong indicator of sewage or animal waste contamination.

- Janina Douglas, Chair of the Northwest Ohio Rotary Water Committee, Rotary Club of Toledo
- Kelly Frey, Sanitary Engineer, Ottawa County Sanitary Engineering Department
- Kari Gerwin, Director of Water Quality Planning, Toledo Metropolitan Area Council of Governments (TMACOG)
- John Glaza, Chairman, Israel Advocacy Task Force, Jewish Federation and Foundation of Greater Toledo
- Doris Herringshaw, President, Board of Commissioners, Wood County
- Laura Johnson, Director, National Center for Water Quality Research, Heidelberg University
- John Levine, President, The Image Group
- Stephen Rothschild, Executive Director, Jewish Federation & Foundation of Greater Toledo
- Wade Smith, District Trustee, Ohio Farm Bureau Federation
- Mark Stahl, Commissioner, Ottawa County
- Frank Szollosi, Great Lakes Climate Policy Director, National Wildlife Federation

During the course of the mission the participants will be exposed to the many water technologies that Israel has to offer, and they will experience firsthand how innovative and effective these technologies are. The goal of the mission is to expose these individuals to these technologies, with the hope that the technologies can be introduced in the state of Ohio to address specific issues within the state.

Updates:

Due to the outbreak of COVID-19, travel bans, and mandatory two-week quarantine, the mission had to be postponed until further notice, when new dates are able to be established.

Trumbull County, Ohio

In August of 2019, Representative Gil Blair, reached out to Sam Hoenig, Negev Foundation President, about a few issues that he saw within Trumbull county. Some of these issues included failing septic systems, algal blooms and hydraulic fracturing and injection wells.

Following the initial discussion of the issues within the county, Sam Hoenig and Kristeena Blaser, OIACI Program Director, met with members of the Trumbull County

Combined Health District and two House of Representative members from the area to discuss the project in further detail and discover what opportunities for partnerships exist.

Partners:

- Kristofer Wilster, Director of Environmental Health, Trumbull County Combined Health District
- Frank Migliozi, Health Commissioner, Trumbull County Combined Health District
- Gil Blair, State Representative, House District 63
- Michael O'Brien, State Representative, House District 64
- Bonnie Deutsch Burdman, Director, Community Relations and Government Affairs, Youngstown Area Jewish Federation

Following this meeting, the OIACI Program Director had a follow-up phone conversation with Frank Migliozi, Health Commissioner and Kristofer Wilster, Director of Environmental Health, to discuss potential locations for a scaled demonstration with Fluence, a decentralized wastewater treatment company. Frank and Kristofer suggested Southington Township as a good location for a scaled demonstration, as everyone is running off an individual septic tank and large amounts of them are failing.

The OIACI Program Director had a call with Skip Haynes, who is the Chair of the Water Committee for the County. The OIACI Program Director and Negev Foundation President are planning to make a trip to Southington Township to do a site visit, evaluate the location, and determine how well a scaled demonstration would function within the area.

In addition, Frank Migliozi put the OIACI Program Director in touch with Roger Peterson from Bloomfield, OH who was looking for a similar project to Southington. OIACI Program Director has had a phone call with Roger and plans to visit the Bloomfield area, following reviewing information sent by Roger. To learn more about this opportunity please read the Bloomfield & Southington, Ohio section located under the Extended Partnerships to Meet Ohio-Specific Needs through Field Trials and Pilots header.

Cleveland, Ohio

Lake Erie Commission

OIACI and the Negev Foundation met with Joy Mulinex, Director of the Lake Erie Commission on December 6th, 2019 to discuss H2Ohio funding. The OIACI Program Director gave a prepared presentation that stated the Initiative's H2Ohio agenda, if the funding request was approved. The goal of the meeting was to get Joy's feedback on the presentation and the funding document request that was put together, as well as any updates that she might have on how the funding process will work. In addition, the OIACI Program Director asked for her opinion and any suggestions she might have on how to make the presentation and document stronger and to make the opportunity of getting funding as likely as possible.

On May 8th, 2020, OIACI Program Director Kristeena Blaser and Negev Foundation President Sam Hoenig had a conference call with Joy Mulinex, Lake Erie Commission Director for the Office of the Governor, to discuss potential H2Ohio pilots and to seek her help finding an additional project that we could use Cleveland Foundation grant monies on. Joy reached out to her contacts in several areas within the water sector to try to vet some projects for OIACI. Following this call, the OIACI Program Director put together a document that contained information on all the companies that OIACI works with from Israel that are applicable to a water-based project. Joy reached back out on May 25th, 2020 to let OIACI know that she was still reaching out to individuals and making contacts for OIACI. She stated she was hopeful to hear back from interested parties following quarantine.

Jewish Federation of Cleveland

On June 18th, Abby Weissfeld, Associate Director Development & Communications, contacted her previous supervisor Jessica Semel at the Jewish Federation of Cleveland regarding the Woosh and Cleveland Metropolitan School District project that OIACI is working on. Jessica mentioned that Daniel Cohn at the Mt. Sinai Health Care Foundation, who is the lead person on the Lead Safe Cleveland Coalition²⁸, may be a great contact for this project.

²⁸ The Lead Safe Cleveland Coalition is an inclusive public-private partnership founded to address lead poisoning through a comprehensive, preventive, and long-term approach. This approach protects Cleveland's children by merging smart, adaptable public policies; knowledgeable agencies willing to collaborate; proven community programs; and public and private sector accountability.

Abby followed up this conversation by reaching out to Daniel Cohn who referred her to Ali Foti, who is the Program Officer for the Mt. Sinai Health Care Foundation. To learn more about this project please go to the Woosh & Cleveland Metropolitan School District section located under the Extended Partnerships to Meet Ohio-Specific Needs through Field Trials and Pilots header.

Mt. Sinai Health Care Foundation

The Mt. Sinai Health Care Foundation seeks to assist Greater Cleveland's organizations and leaders to improve the health and well-being of general communities now and for generations to come. The Mt. Sinai Health Care Foundation focuses on the health of the urban community. They seek to support especially those projects focusing on health promotion and disease prevention that have the potential to access large populations through existing community infrastructure. To optimize impact in large populations, partnering with both public and private funding sources may be appropriate and necessary. Their particular interests are proposals focusing on primary preventing and early intervention.

OIACI reached out to the Mt. Sinai Health Care Foundation regarding a potential partnership for the Woosh and Cleveland City Schools Project. To learn more about this project please see the Woosh & Cleveland City Schools section located under the Extended Partnerships to Meet Ohio-Specific Needs through Field Trials and Pilots header.

Columbus, Ohio

The Ohio State University

The OIACI Program Director contacted our Advisory Board Chair, Steve Slack, to seek advice on who the appropriate parties are within Ohio State University's research faculty and staff to reach out to regarding hemp. Steve Slack referred the OIACI Program Director to Gary Pierzynski, who is the Associate Dean for Research and Graduate Education and the Director of the Ohio Agricultural Experiment Station, which is a part of the College of Food, Agricultural, and Environmental Sciences at The Ohio State University.

Gary is the point of contact for all things regarding hemp at OSU. OIACI asked Gary to reach out to the members of his research community for

research proposals specific to hemp. Gary sent an RFP via email to the entire research community within his department at OSU asking for project proposals. The OIACI Program Director gave the research community a little over a month to develop their project proposals including budgets and received four proposals in total. OIACI is currently working to secure funding for one of these projects, which will be a joint partnership between an Israeli company, OIACI, and OSU.

Cincinnati, Ohio

Regional Economic Development Initiative (REDI) Cincinnati

The OIACI Program Director and Cierra Clymer, Manager of Projects & Business Development of REDI Cincinnati, spoke to discuss a potential partnership moving forward. REDI Cincinnati is an organization that is the first point of contact for companies locating or growing in the 16-county region at the heart of Southwest Ohio, Northern Kentucky, and Southeast Indiana. In addition, they are the JobsOhio regional partner for Southwest Ohio. The OIACI Program Director and Cierra discussed that there is great potential for collaboration and partnership between our two organizations. The two parties agreed to have a quarterly call, as well as to refer any companies that might be best suited for the other organization.

H2Ohio

On November 14th, 2019 Governor Mike DeWine unveiled H2Ohio, a comprehensive, data-driven water quality plan to reduce harmful algal blooms, improve wastewater infrastructure, and prevent lead contamination. Governor DeWine's H2Ohio plan is an investment in targeted solutions to help reduce phosphorus runoff and prevent harmful algal blooms through increased implementation of agricultural best practices and the creation of wetlands; improve wastewater infrastructure; replace failing home septic systems; and prevent lead contamination in high-risk daycare centers and schools. The Ohio General Assembly invested \$172 million in the plan in July. The OIACI is requesting \$500,000 annual for a two-year period to implement up to five scaled demonstrations or field trials. This will expand OIACI's reach and demonstrate the value of our initiative in bringing new and innovative Israeli companies and technologies to participate in scaled demonstrations or field trials with partner municipalities, organizations, companies or academic institutions

throughout the state of Ohio. Below are meetings that took place specifically to discuss H2Ohio funding with the decision makers responsible for allocating monies.

Update²⁹s:

As the state experienced major budget cuts across state agencies, the H2Ohio fund was no exception. While some funding was still made available to the agencies, a majority of funding was given back to the state government for COVID-19 relief. While this has drastically impacted the OIACI programs specific to H2Ohio, OIACI is still working with several state agencies on other projects. In addition, OIACI is still working on the projects that are related to H2Ohio, in preparation for if and when funding becomes available again.

Ohio Environmental Protection Agency (EPA)

OIACI and the Negev Foundation met with Tiffani Kavalec, Chief of the Division of Surface Water and Amy Klei, Chief of the Division of Drinking and Ground Waters on December 3rd, 2019 to discuss H2Ohio funding potential and projects and partnerships with the agency.

Other individuals in the meeting:

- Rob Mitlner, Water Scientist and Specialist
- Dr. Ruth Briland, Harmful Algal Blooms Specialist

During the meeting, OIACI and the Negev Foundation President were informed of the EPA's agenda regarding H2Ohio funding. The agency will namely take on projects regarding wastewater infrastructure and harmful algal blooms. OIACI, the OH EPA, and BlueGreen Water Technologies are currently having discussions regarding the possibility of BlueGreen Water Technologies treating one of the major lakes in the state of Ohio, following their success at Chippewa Lake. They are hoping to treat either Buckeye Lake or Grand Lake St. Mary's.

On February 26th, the OIACI Program Director had a call with Ruth Briland, the Harmful Algal Blooms Specialist regarding Maumee Bay State Park and the potential use of it as a demonstration site. Dr. Briland stated that they do in fact have major issues with algal blooms in the park and are looking for solutions to the problem. They currently have massive monitoring projects

²⁹ To learn more about the projects OIACI was working on in relation to H2Ohio, please see Appendix B

underway because this is such a popular state park. However, they have been unable to find a solution to the E. coli and HAB issue that the park faces. OIACI mentioned the use of BlueGreen Water Technologies' newest line of products which are Hydrogen Peroxide-based, making it incredibly environmentally conscious and safe for the ecosystem and over biome in the park. Ruth recommended that the OIACI Program Director speak to Natalie Pirvu, as the ODNR are the ones actually responsible for the management of the park. Natalie is the Environmental Programs Administrator for the Ohio Department of Natural Resources, Division of Parks and Watercraft.

Ohio Department of Natural Resources (ODNR)

OIACI and the Negev Foundation met with Director Mary Mertz on November 6th, 2019 to discuss H2Ohio funding, as well as potential projects and partnerships with ODNR moving forward. During the course of the meeting, OIACI and the Negev Foundation learned that the OH EPA will be leading the first round of vetting for technologies related projects and the ODNR will be namely focused on the establishment of Ohio wetlands. They will specifically be focused on the 4 large lakes throughout the state. The Director emphasized her intention not to fund research at educational institutions, but rather to focus on projects that are already tested, ready to be implemented, and going through the proper vetting channels.

Following her conversation with Ruth Briland at the Ohio EPA, the OIACI Director got in touch with Natalie Pirvu at the ODNR. They had a conference call on March 13th, 2020 to further discuss Maumee Bay State Park. Natalie was very informative and provided ample information to the OIACI Program Director. Following their initial discussion, they had an additional conversation to go into further detail, as the initial call did not allow enough time.

OIACI, the Negev Foundation and BlueGreen Water Technologies participated in a conference call with Ohio Department of Natural Resources Director Mary Mertz on June 11th, 2020 to speak about having BlueGreen Water Technologies use their innovative technologies to treat either Buckeye Lake or Grand Lake St. Mary's. In addition, several other lakes that could be treated were brought to OIACI's attention. Some of those lakes included Crane Lake and Kiser Lake. OIACI, BlueGreen Water Technologies and ODNR are currently working out a strategy to make this opportunity a reality.

Ohio Department of Agriculture

OIACI and the Negev Foundation had a conference call with Ohio Department of Agriculture Director Dorothy Pelanda on May 13th, 2020. They discussed what would become of the H2Ohio program with all the unspent funds being used for COVID-19 relief. Director Pelanda stated that they were able to retain some of the funds for H2Ohio-related projects. However, OIACI was informed the money would be going directly to farmers and they would not be allocating any to organizations or entities such as OIACI. Director Pelanda did suggest that we speak to farmers in the Maumee River Watershed about using an Israeli technology for a field demonstration or speak to a Soil & Water Conservation District in those counties as they would be good sources of additional funding as well.

Ohio Governor's Office

OIACI and the Negev Foundation met with Anne Vogel, the Assistant Policy Director for the Governor's Office on December 19th, 2019 to discuss H2Ohio funding and to get feedback and support for the governor's office. Anne Vogel expressed great interest in BlueGreen Water Technologies' algaecide, as harmful algal blooms are greatly affecting the water ways within the state. Anne Vogel also invited Amy Klei, the Chief of the Division of Drinking and Ground Waters to the meeting, as the subject matter expert. They were both very helpful and were looking forward to potential partnership opportunities.

EXTENDED PARTNERSHIPS TO MEET OHIO-SPECIFIC NEEDS THROUGH FIELD TRIALS AND PILOTS.

Warren County Agricultural Hub

The goal of this project is to create a collaborative agricultural space in the Youngstown/Warren area that can be used for varying purposes, with a focus on highlighting innovative Israeli technologies. Some examples of the use of the space include growing, cultivating and processing of hemp, a collaborative research space for Youngstown State University, community

garden, nursery, aquaculture, or an agricultural grow center for high value crops³⁰.

On January 3rd, 2020, the OIACI Program Director and the Negev Foundation President traveled to Weathersfield, OH to meet with individuals listed below as a means of continuing the discussion about the agricultural economic development project that OIACI is proposing for the region.

Partners:

- Michael O'Brien, State Representative, House District 64
- Gil Blair, State Representative, House District 63
- Barbara Ewing, Chief Executive Officer, Youngstown Business Incubator³¹
- Dr. David Rouan, Township Administrator, Weathersfield Township
- Steven J. Gerberry, Trustee, Weathersfield Township
- Shea MacMillan, Manager, Business Development, Youngstown/Warren Regional Chamber
- Nicholas S. Santucci, Director, Government and Public Affairs, Youngstown/Warren Regional Chamber

On February 2nd, 2020 the OIACI Program Director visited the Warren Depot, which OIACI is hoping to use for this agricultural project³². As it is currently an unused space, with a few upgrades and retrofit projects, it would be a perfect fit for an indoor greenhouse/growing location. The original hope was to use this space to grow hemp, as it already meets many of the standards for growing hemp that ODA has established. Some of these specifications include a guard's house/station, the entire property is surrounded by gates, there are security cameras in place and a single access point from the main road. However, growing hemp in an indoor facility, especially growing hemp for fiber, is not the most economically profitable.

There was also a discussion of starting an indoor greenhouse project in the Warren Depot, which could be used to grow other high value crops. There

³⁰ To learn more about this project please see Appendix C.

³¹ Youngstown Business Incubator's mission is to facilitate the creation of high-value businesses through collaborative partnerships that promote innovative technologies and long-term, sustainable employment opportunities, with a focus on information technology and advanced manufacturing.

³² Please see Appendix D for more information about OIACI's visit to the Warren Depot.

was potential to turn this facility into an agricultural hub for growing high value crops. The facility also has a rail line that connects to each facility, allowing for the potential of harvesting, processing, and transporting all from one facility.

In February of 2020, the OIACI Program Director participated in a conference call that included individuals from the Youngstown Business Incubator, BRITE Energy Innovators, Youngstown State and a Tennessee hemp producer L6 Solutions. L6 solutions was interested in establishing an agricultural co-op in the Youngstown area that would allow for several farmers to dedicate a small portion of their land, only a few acres, to growing hemp. The OIACI Program Director suggested that this project take place in multiple sites across the state to identify what soil, climate and conditions the hemp grows best in. In addition, it will allow farmers to identify what species of hemp is best for their designated area. L6 Solutions was not interested in growing hemp for CBD purposes but rather for industrial fiber purposes.

On March 9th, 2020, the OIACI Program Director attended a meeting hosted at BRITE Energy Innovators, located in Warren, OH.

Attendees:

- Barbara Ewing, Chief Executive Officer, Youngstown Business Incubator
- Rick Stockburger, President & CEO of BRITE Energy Innovators³³
- Mandy Orahood, Organization Director, Trumbull, Lake, Ashtabula & Geauga County Farm Bureau
- Kendra Corpier and Todd Hasson, L6 Solutions
- Michael Hripko, Associate Vice President, External Affairs, Government Relations, and Economic Development, Youngstown State University
- State Representative Gil Blair, District 63, Ohio House of Representatives
- Lee Beers, Extension Educator, Agriculture & Natural Resources, OSU Extension Trumbull County
- Andrew Holden, Extension Educator, Agriculture & Natural Resources, OSU Extension Ashtabula County

³³ BRITE Energy Innovators – Ohio's energy tech incubator – is dedicated to ensuring the success of startups driving innovation in energy tech. They accomplish this by offering consultation services to startups & small-and-medium-size enterprises, lab space and equipment for device testing and R&D and affordable office space and coworking memberships.

The agenda for the meeting was as follows:

- Opening – given by Representative Gil Blair
- OIACI Overview – given by OIACI Program Director
- Hemp Opportunities and Discussion – led by L6 Solutions
- Discussion and Next Steps – led by Barbara Ewing
- Closure and Invitation to tour BRITE – given by Rick Stockburger

During the meeting, several topics were discussed, including what types of high value crops would be grown if hemp was not selected as the crop of choice. The group decided that the Warren Depot would not be a great place to grow hemp, simply because of how much space hemp needs to grow. However, there was discussion still of turning that space into an indoor greenhouse that would be used to grow other high value crops such as spices or flowers. It was decided that the hemp growers, L6 Solutions, would grow for industrial purposes, namely clothing or fiber. They currently grow for CBD oil and have found the market to currently be flooded with CBD. Furthermore, the market is very unstable, making it hard to make a profit off selling CBD.

OIACI Program Director and Barbara Ewing communicated in early July to reconstitute the project following a 3-month quarantine. Barbara had volunteered to take the lead on this project, especially in the case of finding funding for the project. She stated that there is a federal grant that she feels would be applicable to the project. In addition, she was contacted by an individual who is doing work in the same space, who is interested in potentially being a funding source for a collaborative project. They are set to discuss this possibility further following this individual's return from vacation.

Bloomfield & Southington, Ohio

Southington

The OIACI Program Director was referred to Skip Haynes, the Chair of the Water Committee from Southington Township. Southington is located in Trumbull County in the heart of the historic Connecticut Western Reserve. The township has just over 3,000 residents and is situated roughly midway between Cleveland to the northwest and Pittsburgh to the southeast.

Skip was looking to establish a decentralized wastewater treatment solution in his township because currently all homes and businesses in the area were

running off separate septic systems. The problem however was that many of these septic systems were failing or were no longer in compliance with OH EPA standards, therefore needing to be replaced.

Skip had been trying for years to get a wastewater system installed in his township. The township did just receive a loan from the OH EPA to put in a central water line, the first phase of the project was completed at the end of 2019. Skip informed the OIACI Program Director that no previous study on wastewater use had ever been done in his township; therefore, it would require a study to be done in order to install any systems.

Skip informed OIACI that there was an existing small treatment plant that was located at the old k-12 school that was no longer in use. However, the school still owns the property and is unwilling to part with it. Even so, discussions had begun with the OH EPA to turn this space into a small wastewater treatment location for homes and businesses located near the school. OIACI is working with Southington to try and get a Fluence Corp system installed in this location.

OIACI reached out to Ronen Barkan, North America Sales Manager, about the feasibility of such a project. Ronen stated that this was definitely a project that Fluence would love to get involved in. Furthermore, their decentralized systems would work whether the location was the old school or a pod-like community of homes running off of one system, like OIACI had originally suggested to Skip. OIACI stated that a potential scaled demonstration could involve a system being installed for 5-7 homes (depending on usage). As part of this demonstration a study can be done, as one has never been done before, regarding wastewater usage and the effluent that is put out could be tested as well.

Bloomfield

North Bloomfield is 25 square miles and is situated in the heart of the Connecticut Western Reserve. Just over 1200 residents call Bloomfield home. Bloomfield is 36% owned by non-profits or the State of Ohio. This means that over 1/3 of their community cannot expand out and does not receive any form of property taxes. There are multiple tributaries to the Grand River which sites on the west side of North Bloomfield. These tributaries are carrying contaminated effluent from the outdated septic systems to the river, which in turn leads to Lake Erie.

Bloomfield has the same problems as Southington, in that they have been trying to get a centralized wastewater treatment system in place for years with no success. Roger Peterson Jr., the Bloomfield Township Trustee reached out to OIACI to see if there was a potential solution for their problem. Again, OIACI discussed this possibility with Fluence. Bloomfield was also looking for a decentralized solution to their failing septic systems, as a centralized system was too costly for their township.

OIACI is working with Bloomfield and Southington to find potential funding sources so that a scaled demonstration can be done with Fluence's technology; following the completion of this demonstration, there is the potential for more systems to be installed or the state to provide funding to these areas for a larger more centralized system.

Maumee Bay State Park

Maumee Bay State Park is a state park in Jerusalem Township, Lucas County, Ohio. It is a 1,336-acre park that has resort lodges and cottages for visitors, and camping and gateway rentals as well. Common activities include hiking on the trails, picnicking, golfing, fishing, hunting, winter sports, boating, swimming, and visiting the nature center.

The balance of recreational facilities with the natural world gives visitors a diverse experience in a coastal environment. The wetlands of the Maumee Bay area offer a vivid array of natural wonders. Wetlands contain more species of wildlife than any other habitat type.

Maumee Bay State Park has two beaches, each with its own water quality issues. The inland lake suffers from issues dealing with its population geese, producing large E. coli outbreaks in this inland lake. The beach that is located along the Lake Erie shoreline suffers from any of the harmful algal blooms that can be found in the larger Lake Erie. Often the algal blooms in Lake Erie drift into the Maumee Bay State Park. Both of these water quality issues cause the beaches to be one of the "dirtiest beaches" in the US, which is based on the number of times that the beaches must close due to HABs.

The OIACI Program Director had a discussion with Natalie Piruv, Environmental Program Administrator for the Ohio Department of Natural Resources, Division of Parks and Watercraft, in early March regarding the

possibility of using Maumee Bay State Park as a site for H2Ohio-funded programming. Natalie stated that they have had problems with both beaches for years.

The inland lake is flooded with geese that cause the E. coli outbreaks, and the beach located on Lake Erie is subjected to the algal blooms that the larger Western Basin of the lake experiences. Natalie informed OIACI that, while ODNR manages the park, it is actually the Ohio Department of Health that takes water quality samples at Maumee Bay State Park, especially on the inland beach, due to the bacteria. ODNR has also partnered with the University of Toledo and their Lake Erie Center to do more frequent and regular sampling of the waters, specifically after heavy rainfall.

OIACI reached out the University of Toledo Lake Erie Center to see if it would be possible to get access to this data so that a demonstration with BlueGreen Water Technologies could take place. OIACI is currently in the process of reconstituting this project after the 3-month quarantine.

Chippewa Lake Demonstration

During the week of August 5th, 2019, BlueGreen Water Technologies treated Chippewa Lake in Medina County, Ohio. Chippewa Lake is a 330-acre recreational water body that is the largest inland natural lake in Ohio. It is often used for fishing, canoeing, boating, and water-skiing. It has two beaches, a yacht club, and an upscale restaurant.

BlueGreen Water Technologies' goal was to remediate a bloom surge in within the lake that had the potential to turn into a full-blown toxic cyanobacterial outbreak (TCO) in the following months if left untreated. The Lake Guard™ Blue was applied once a surge in cyanobacterial biomass was detected in the lake. The surge in cyanobacterial levels was visible to the naked eye, with cyanobacterial mats spotted on the eastern shore of the lake.

Lake Guard™ Blue was applied directly from a boat during the morning hours at a total dose rate of ~5lb/acre. The product, which is packaged in 50-lbs bags, was gravity released from the edge of a moving boat. Once the waterborne product was organized over the western perimeter of the lake, it was carried by western winds and currents that scattered the floating particles alongside cyanobacterial

aggregates. The total application time of 1,500lb of Lake Guard™ took less than 30 minutes and was no longer visible to the naked eye within a few hours.

Following the treatment, the phytoplankton assessments indicated a clear and immediate shift from dominating toxic cyanobacterial species toward a healthy variety of algal species. There was no evidence of any adverse impact to either the fauna or the flora of the lake.

Cleveland Foundation Pilots

Cleveland Metroparks Pilot

In this pilot, Dr. Teresa Cutright of the University of Akron intends to compare the efficacy and cost of LakeGuard™ and Cutrine®-Ultra to determine which of the two products is most suitable to control algal blooms in recreational lakes and/or ponds.

At the conclusion of the pilot, a report outlining the experimental procedures, results, and statistical analyses will be drafted and made available to the public. It is expected this report will inform future decisions about algaecide use in the City of Cleveland and beyond.

Partners:

- Dr. Teresa Cutright, Professor of Civil Engineering, University of Akron
 - David Lowry, Graduate Student, University of Akron
- Dr. Terry Robinson, Director of Natural Resources
- Mike Durkalec, Aquatic Biologist at Cleveland Metroparks
- BlueGreen Water Technologies Representative
- Cutrine®-Ultra Representative

Updates:

Dr. Teresa Cutright informed OIACI that they have completed all the bench scale experiments for the project. They are currently in the process of completing statistical analyses of the conditions (algaecide source, algaecide concentration, phycocyanin levels, chlorophyll-a, cell count, pH, and temperature). In addition, they are identifying organisms that were present at each step in the research process. She stated that identification of these organisms will take time, as one must match the image to a known key for verification. However, once that process is complete, this information will

be used to help assess which cyanobacteria or green algae are more susceptible to treatment with the algaecide.

Cuyahoga Soil & Water Conservation District Pilot

In this pilot, Justin Husher, a Natural Resource Conservationist with the Cuyahoga Soil and Water Conservation District (SWCD) intends to show that improving existing soil on pilot sites through the utilization of cover crops with assistance from Rootella™, a product of GroundWork BioAg, will be more cost-effective than the current method used for urban land bank lots, which is trucking in new soil. Further, he hopes to create a model to build healthy, functioning, and living soil that can sustain tree, shrub, and agricultural plant life and be utilized in more lots in Cleveland and in other communities. If these lots can be transformed into healthy, thriving, and living spaces, benefits may be seen in the following areas:

- *Stormwater Management*: health soil retains more water, which means less street and sewer flooding during periods of heavy rainfall.
- *Ecosystem Health*: organisms in healthy soil perform numerous vital functions in the soil ecosystem which have direct interactions with the biological, atmospheric, and hydrological systems. In addition to water retention, they are responsible for nutrient cycling, regulating the dynamics of soil organic matter, soil carbon and greenhouse gas sequestration, and enhancing plant health, among others.
- *Community Building*: vacant lots do not contribute to community wellbeing.

At best they are an ignored public space, making no impact, and at worst they are avoided because of a real or perceived negative impact. Improving vacant lots can build a sense of community by the simple task of beautifying a public space or creating an active center of community engagement, such as a flower garden or even a hub of urban agriculture. Plantings as a means of community development is supported by the Cleveland Tree Plan.

Partners:

- Justin Husher, Natural Resource Conservationist, Cuyahoga Soil and Water Conservation District
- The Dunham Tavern Museum, provided "Site 1" (1 acre)

- The West Creek Conservancy, which owns land on Kinsman Farm that will be provided for "Site 2" (3/4 acre)
- Rust Belt Riders, which works in Northeast Ohio to provide alternatives to disposing of food waste in landfills, will be contracted to conduct lab services.
- Patrick Connolly, Administrator, Cuyahoga Soil and Water Conservation District
- Youth Opportunities Unlimited (YOU)
- Ubuntu Cultivators

Updates:

As of September 27th, the Kinsman Farm site had been brush hogged, tilled, seeded, and sprouted. The East 94th/Gorman site has been tilled and was seeded on October 2nd. Soil samples have been taken from both sites and were in the drying phase before being sent out for analysis. They are using 12 different cover crops over the two-year period with eight different plantings. Some species will be planted singly; whereas, others will be planted as cover crop mix. Furthermore, over the two-year period separate soil tests will be performed at the beginning, middle and end, and three times in between those two years. They will be looking at what happens to organic matter and what happens to micro-organisms. Additionally, they will be looking for changes in color and changes in soil aggregation.

In late February 2020, Justin Husher reached out to OIACI to inform them that he had recently resigned from the Cuyahoga Soil & Water Conservation District to pursue orcharding. Due to his retirement, he would no longer be working on the project; however, he provided a contact for Brent Eysenbach who would be responsible for the cover crop project moving forward.

Janine Ryba, Director of the Cuyahoga Soil & Water Conservation District reached out to OIACI to state that, if they needed anything regarding the project, to reach out to her directly. When OIACI reached out to her for reporting purposes for the Cleveland Foundation, they were informed that Jakob Hamlescher an Urban Technician for the Cuyahoga Soil & Water Conservation District started back in May and will be taking over the project for the future. He did inform OIACI that not much work has been done on the project, other than a seeding that happened in June due to Justin leaving and Jakob's late joining.

Avon Lake Pilot

Todd Danielson, Chief Utilities Executive of Avon Lake Regional Water, has proposed a pilot using leak detection technology created by the Israeli company Utilis. Mr. Danielson learned of this technology and its potential through Alex Margevicius, Water Commissioner of the Cleveland Division of Water, who has previously met and worked with Utilis. This technology uses satellites and microwaves to detect leaks, and is successfully used in Israel and many other countries.

In this pilot, Mr. Danielson hopes to accurately detect leaks in Avon Lake's water distribution system and transmission lines. This pilot will pave the way for Avon Lake to integrate consistent use of Utilis' technology to help reduce the chances for negative public health consequences. While also saving the 200,000 people who receive water produced by Avon Lake Regional Water a considerable amount of money through proactive, rather than reactive, maintenance.

Updates:

Following several attempts to get this project up and running, Avon Lake decided they did not have the budget to complete the project. Following this decision, the OIACI Program Director began searching for additional projects that would have an impact on the Cleveland community and be beneficial for water quality improvement.

Potential New Pilots

Cleveland Water Alliance Smart Citizen Science Fund

The OIACI Program Director reached out to Bryan Stubbs, President of the Cleveland Water Alliance, to see if there were any projects they were currently working on or needed additional funding for. Bryan directed the OIACI Program Director to Max Herzog, who is a Program Manager for the Cleveland Water Alliance.

Max introduced the Program Director to the Smart Citizen Science Project which is funded through the Great Lakes One Water Partnership (GLOW). GLOW is a Great Lakes basin-wide initiative designed to engage shoreline community foundations in all five Great Lakes around water. The Cleveland Water Alliance (CWA) was selected to lead the Lake Erie Regional team,

which means that they will be partnering with community foundations, citizen scientists, and water quality experts to collect data on water in the Lake Erie Basin. There is a total of 7 community foundations that are providing funding for projects that are specifically related to Lake Erie.

Max stated that the program was recently developed an app in partnership with the University of Akron; however, they were still looking for expertise in water quality monitoring to make sure that the app was fully functional. In addition, the app was only accessible to iPhones, and CWA wanted to be able to use the app on Androids and tablets. CWA also relies on volunteers to collect the water samples and is in need of high-tech field devices that allows these volunteers to collect water samples and analysis those samples.

The OIACI Program Director suggested that there were two potential partnership opportunities that existed. OIACI recommended that CWA bring a water quality monitoring expert onto the project to lead seminars and webinars to provide instructions for volunteers and other staff on how to take water samples and analysis them properly. The OIACI Program Director recommended the company IOSight, as they are well versed in water quality management and have several platforms that could prove useful to CWA.

The second opportunity would be working with an Israeli technology company to develop these field devices. These devices would monitor many things that Ohio water sources suffer from including but not limited to: E. Coli contamination, harmful algal blooms, microcystin levels and toxicity, and other harmful contaminants.

Woosh & the Cleveland Metropolitan School District

OIACI was introduced to Woosh following the WATEC Conference that Josh Brooks, our Israeli Consultant, attended. Woosh has a water filtration system that is specifically designed for schools, as it has additional filtration treatments, as well as multi-tap fill-up stations. The system also targets lead, which the Governor of Ohio has stated to be one of his main focuses for H2Ohio funding. Due to the global pandemic outbreak, Woosh has put additional sanitation measures in place to make sure that using one of their systems does not risk the spreading of COVID-19. They offer touchless fill up, water bottle disinfectant, and have a social distancing protocol in place.

OIACI reached out to the Mt. Sinai Health Care Foundation regarding their Lead Safe Cleveland Coalition program, that OIACI felt might work in collaboration with the current Woosh project OIACI is working on. Abby Weissfeld, Associate Director of Development and Communications for the Negev Foundation, reached out to Daniel Cohn, who was the point of contact for the Lead Safe program.

Abby received a response from Ali Foti, who is the Mt. Sinai Program Officer. She informed us that, while the Lead Safe program might not be a good fit due to their main focus being on lead-based paint in homes, Mt. Sinai is still very interested in such a project. Sam Hoenig, Negev Foundation President, reached out to Mitchell Balk, the Mt. Sinai President to further discuss the potential options that existed. OIACI and the Negev Foundation are scheduled to discuss the project with Mitch Balk, Daniel Cohn, Mt. Sinai Vice President of Strategy, as well as Ali Foti for later in the month of July.

OIACI is hoping to get additional funding from the Mt. Sinai Foundation so that they can expand upon the Woosh and Cleveland Metropolitan School District project that they are working on to include 2 additional systems.

Cleveland Division of Water Pilot

Cleveland Division of Water ran 3 separate pilots with Utilis during 2018. The first pilot looked at 350 miles of water mains and found 114 potential leaks. 110 of them were investigated on the ground using traditional point to point acoustic leak detection technologies. 15 of these 110 were actual leaks, giving it a 14% hit rate.

The second pilot looked at 545 miles of water mains and found 138 potential leaks. 24 of the 138 were investigated on the ground using traditional audio methods and 15 actual leaks were found, giving it a 58% hit rate.

The third pilot was undertaken in October of 2018, which looked at 702 miles of water mains. 100 potential leak spots were identified and 66 of these were investigated using traditional audio methods. Of the 66 investigated, 13 actual leaks were found, creating a 20% hit rate.

Overall, the pilots looked at 1,597 miles of water main and found 42 leaks. While the number of leaks is low, the time required to find these leaks is much

lower than traditional leak detection methods. Cleveland Water District had previously inspected 2,814 miles of water mains during an 18-month period using traditional methods. All three pilots took a combined 30 days of field work on half of the water mains managed by the Cleveland Water District. Extrapolating the combined data for the 3 pilots, it would take the Cleveland Water District roughly 105 days to do the necessary field work on half of the water mains they manage. Using this figure, using Utilis' technology allows the work to be done 5 times faster than traditional leak detection methods. In addition to being able to conduct leak detection of an entire system on a much quicker time table, it also offers a potentially cheaper solution.

During these Cleveland pilots, it was theorized that road salt impacts the results produced by the Utilis technology, which would explain the high number of false positives. As this is not an issue faced in Israel, Utilis is making the necessary changes to solve this issue to provide more accurate leak detection results.

Demo Unit at Ohio State University's South Center

OIACI continued to support the training seminars at Ohio State University's South Centers where Israeli Agribusinesses are showcased through literature, demonstrations, and field trails.

The following companies are showcased:

- Amiad Filtration Systems – filtration systems for the agricultural industry
- Arad – water meters for domestic, agricultural, and waterworks industries
- A.R.I. – flow control accessories
- Arkal Industries – water treatment filters and plastic leisure garden products
- BioBee – Integrated Pest Management (IPM) and biological pest control in greenhouses, nurseries, and open fields for crops such as berries/soft fruits, grapes/vineyards, and fruit trees/orchards
- Dorot – automatic control valves for agricultural, industrial and waterworks applications
- GroundWork BioAg – mycorrhizal inoculants for mainstream agriculture
- Kamel – unique plastic pots and containers for use by produce growers, floriculture nurseries, horticulture nurseries, wholesalers and retailers.

- Mapal Plastics, Agricultural Products Division – troughs and other systems for soil-less and hydroponic greenhouses
- NaanDanJain Irrigation – irrigation and climate-control technologies for greenhouses, nurseries, fields, orchards, landscape, and industry.
- Netafim – drip irrigation products and water management solutions
- Paskal – orchard, vineyard, and greenhouse trellising items, including hooks, clips and trestles
- Pelemix – coco coir-based substrates for greenhouses, nurseries, potting soil and gardening
- PIP Pulsating Irrigation Products – foggers for fogging in greenhouses, FrostTech for frost protection
- Technoram – modular, high quality, cold-weather resistant manifolds in various sizes for drip irrigation systems
- Tefen Plastic Products Ltd. – fertigation equipment

FINANCIAL ACHIEVEMENTS

OIACI has facilitated at least **\$98,158,294.11** worth of exports from Ohio to Israel, including Ohio to Israel services, Ohio business attraction, contracted research from an Israeli company done by an Ohio company, Ohio to Israel exports and joint ventures between Ohio and Israel. OIACI has worked with several Ohio companies to export their products to Israel, some of these companies include World Wide Sires, Bunker Hill Cheese Company, OmegaSea, Almondina, Ricerca Biosciences, and T. Marzetti Company, among many more. OIACI has helped create at least **25** jobs within the state of Ohio and at least **8** in Israel. OIACI has helped facilitate at least **\$6,588,969.30** worth of exports from Israel to Ohio. Lastly, OIACI has attracted Israel-based *Afimilk* to build its North American headquarters in Ohio, which has created 3 full-time jobs and has retained 3 others.

These reported numbers are trackable and are provided to OIACI on a voluntary basis by the various companies that OIACI has worked with in the past and works with presently. However, there are several companies that OIACI has worked with and currently works with that are unwilling to report their financials due to proprietary reasons. Therefore, the true value of exports, jobs created and business attraction that OIACI has facilitated cannot be measured.

MISCELLANEOUS

Advisory Committees

The Initiative continued to maintain and update the list of members of the Ohio-Israel Ag & CleanTech Advisory Committee as members may change, leave their current roles and are replaced by new individuals. The Initiative continued to build an Advisory Committee to be dedicated to the CleanTech sector of the Initiative with a focus on water and wastewater.

December 12th, 2019

The OIACI Program Director and the Negev Foundation President met with Chris Gibbs and Steve Slack, two members of the Advisory Committee. Chris Gibbs is currently running for Congress as an independent voice for Ohio's 4th Congressional District and is running his own farm, Gibbs Farms, in Maplewood, OH. Dr. Steven Slack, a recently retired Professor Emeritus of Plant Pathology at The Ohio State University, is also the chairman of the CleanTech Advisory Committee.

Updates:

Due to COVID-19, OIACI's annual advisory committee meeting had to be postponed. They are currently in the process of rescheduling the meeting to be a virtual meeting, so that proper COVID-19 protocols are followed and everyone on the committees feels safe participating. The current date has not been confirmed, however OIACI is actively working to put the event together.

Website

The Initiative continued to work on creating a new and improved website which will include rewritten and updated description of the Initiative's activities. These changes include, updates in all three sectors, upcoming events, and links to other resources and partner organizations.

Personnel

Dr. Sarah Horowitz

Dr. Sarah Horowitz retired after 15 years of dedication to the Initiative in August of 2019.

Kristeena Blaser

Kristeena Blaser joined OIACI at the end of August 2019 as the Program Director. She has previously worked for Aramark at Kent State University, as a Sustainability Coordinator for dining services. Kristeena received her Master of Science in Environmental Studies from Ohio University in 2017 and her Bachelor of Arts in Political Science, with a focus on Environmental, Climate Change and Sustainability Politics in May of 2015 from Ohio University.

Josh Brooks

Josh Brooks, a Hydrogeology PhD candidate at Ben Gurion University of the Negev was hired as an Israeli Opportunities Consultant. Josh works part-time from Israel and serves as a liaison for the Initiative.

Abby Weissfeld

Abby joined the Negev Foundation and OIACI in May 2020 and serves as the Associate Director of Development and Communications. She has previously worked for the Jewish Federation of Cleveland as the 2018-2019 Public Education Initiative Fellow, and spent the summer of 2019 in Israel working as a resource development intern at the Kfar Saba nonprofit, Access Israel. Abby received her Bachelor of Arts from Miami University in 2018 with majors in Linguistics, French, and Italian.

Appendix A

The Negev Foundation Ohio-Israel Agriculture and CleanTech Initiative State of Ohio H2Ohio Funding Request

Over the past several years, the Ohio Israel Agricultural and CleanTech Initiative (OIACI) has formed relationships within the Israeli water and wastewater-management sector and with industry professionals, that have coinciding interests expressed within the H2Ohio initiative. The OIACI is requesting \$500,000 annually for a two-year period to implement up to five scaled demonstrations or field trials. This will expand OIACI's reach and demonstrate the value of our initiative in bringing new and innovative Israeli companies and technologies to participate in scaled demonstrations or field trials with partner municipalities, organizations, companies or academic institutions throughout the state of Ohio.

ABOUT

The OIACI was established 15 years ago to promote and enhance trade opportunities, and facilitate technology transfer and cooperation between Ohio and Israel in the agriculture, food, and CleanTech industries. Per the initiative's definitions, "CleanTech" refers to clean technologies dealing with water and wastewater. "Agriculture" refers to activities such as traditional farming, urban agriculture, and agricultural economics. "Food" refers to food production, trade, and marketing.

OIACI has accounted for \$92 million in trade between Ohio and Israel over the last 15 years while working with Israeli companies. OIACI works closely with companies that are on the forefront of development in Israeli water and agriculture management, bringing the technologies and products they produce to municipalities, water and agricultural professionals, nonprofits, and businesses in Ohio.

Objectives in all sectors are achieved by directly connecting with Israeli and Ohio companies. OIACI meets these objectives by participating in trade shows, presenting seminars, facilitating demonstration of company products,

and assisting in technology transfer. The initiative plans mission for delegations in the Ohio and Israel regions and promotes and coordinates collaborative research and development.

In recent years, OIACI has specifically focused on the CleanTech sector and the relationship between agriculture and water systems. The initiative chose to focus on this relationship and establish relevant programming following an in-depth study conducted by the OIACI at the request of the Ohio legislature. The study showed an urgent need to introduce innovative, clean technologies to Ohio to deal with major environmental concerns across the state. As Israel is a world leader in water technologies, OIACI established beneficial relationships with Israeli entities with expertise coinciding with Ohio's needs. OIACI is in a unique position to facilitate communication between Ohio and Israeli entities in the water sector pertaining to agriculture and CleanTech water and wastewater management opportunities.

The OIACI has evolved to recognize the 21st century demands of these growing sectors, and over the past two years has taken the initiative to investigate, identify, and vet CleanTech solutions that meet Ohio's needs.

Through ongoing research, OIACI determined the most pressing challenges in the state of Ohio to be:

- Toxic algal blooms in primary sources of drinking water, including Lake Erie
- Other water contaminants, including lead, threatening Ohio's drinking water
- Fertilizer runoff feeding toxic algal blooms
- Septic tank failure contaminating the surrounding environment
- Lack of sufficient contaminant prevention.

Mission Statement

The Ohio-Israel Agriculture & CleanTech Initiative (OIACI) facilitates the exchange of innovative ideas, products, and professional opportunities in agriculture, food, and CleanTech between Ohio and Israel with the goal of improving resource and economic security for both regions.

Israel and Water Innovation

Israel should not have a surplus of usable water, as 60 percent of the land is desert and the rest constitutes an arid environment. Rainfall has decreased

to half of the 1948 average, meaning the already dry nation is becoming even drier. Simultaneously, Israel's population has grown 10-fold and the country's economy has grown 70-fold.³⁴ Despite this, Israel maintains a surplus of usable water.

Israel does use groundwater and surface water, but the country's biggest successes are drilling deep wells, installing massive desalination plants, reusing treated wastewater, detecting leaks in water infrastructure early, and using drip-irrigation across the county on crops that were engineered to thrive in arid conditions. Israel also commodifies all water, pricing it in a way that discourages waste from the average consumer.³⁵ Israel has been successful in maintaining the country's water supply because early officials realized the predicament they would face if water management was not handled properly. Though research and development in water management, Israel has produced technologies that have addressed the country's needs but, despite the overall benefits, are not in use world-wide. Israel is a world leader in water management, and Israeli technologies can be brought into other countries to solve water-supply problems.

Socioeconomic Considerations

Rapid population growth and movement to urban areas have resulted in less water per capita. Increased stress on urban water systems have led to crumbling infrastructure, leakage, waste, and polluted groundwater.³⁶ Since water is essential to survival, we put a significant amount of effort into accessing potable water or, minimally, water that is safe for agricultural or industrial use. It is estimated that some 80 percent of wastewater goes into waterways without adequate treatment, this can lead to both environmental and human-health concerns.³⁷ Investing in quality water management systems has a high economic return. On average, for every dollar spent on improving water management, there is a four-dollar return.³⁸ Additionally, for

³⁴ <https://www.haaretz.com/science-and-health/how-israel-can-help-a-thirsty-world-1.5392651>

³⁵ <https://www.haaretz.com/science-and-health/how-israel-can-help-a-thirsty-world-1.5392651>

³⁶ <https://www.haaretz.com/science-and-health/how-israel-can-help-a-thirsty-world-1.5392651>

³⁷ <https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-6-clean-water-and-sanitation.html>

³⁸ <https://water.org/our-impact/water-crisis/economic-crisis/>

every \$1 million spent on water infrastructure, more than fifteen jobs are created.³⁹

Ensuring the protection and water quality of Lake Erie is vital for both Ohio's economy and health. The Great Lakes Commission estimates that Lake Erie provides drinking water for more than 3 million in Ohio, generates about \$13 billion annually, accounting for nearly a third of all tourism spending in the state of Ohio. As well as, supports recreation for more than 1.5 million hunters and anglers, and accounts for more than 25,000 jobs in the recreational boating industry.⁴⁰ Environmental concerns such as severe algal blooms, agricultural runoff and excess nitrogen and phosphorus, and untreated sewage into Ohio's lakes and streams, all threaten the overall health of the state of Ohio. Several Israeli companies offer solutions to the problems that are presented in Lake Erie and across the state, such as BlueGreen Water Technologies, Utilis E.P.C. Ltd, Fluence and Groundwork BioAg.

MOVING FORWARD

The OIACI has vetted five Israeli companies with the intent to facilitate water management field trials or scaled demonstrations with their technologies. By requesting \$500,000 per year for two years, the OIACI will have the increased capacity to establish, facilitate, monitor and report on scaled demonstrations with vetted companies. Each scaled demonstration will be allocated approximately \$200,000 overall to purchase materials, access information, and appropriately analyze the outcomes and results of the scaled demonstrations or field trials. The specific funding level may vary based on the needs of the individual demonstration.

The Negev Foundation and OIACI will work with and support the vetted companies to secure resources at the overall minimal cost of running the scaled demonstrations or field trials. OIACI will provide continued support to the companies and communities that are participating in the scaled demonstrations or field trials.

Planning Process

³⁹

http://thevalueofwater.org/sites/default/files/Economic%20Impact%20of%20Investing%20in%20Water%20Infrastructure_VOW_FINAL_pages.pdf

⁴⁰ https://www.edf.org/sites/default/files/content/ohio_rport_r8.pdf

PHASE 1: RESEARCH

1. Identify key water and wastewater issues and management needs in the state of Ohio.
2. Research municipalities with the most severe instances of water mismanagement.
3. Identify key decision makers who may choose to implement scaled demonstration.
4. Match vetted companies with municipalities that may benefit from the companies' technologies.

PHASE 2: PLANNING

1. Speak with key decision makers to establish which municipalities are interested in hosting scaled demonstrations.
2. Introduce vetted companies to interested municipalities.
3. Assess cost of implementing the scaled demonstration in each municipality.
4. Draft individual action plans to implement each scaled demonstration.

PHASE 3: IMPLEMENTATION

1. Work with vetted companies to ensure products and technologies are certified to meet all U.S. implementation standards.
2. Select municipalities to host the scaled demonstration based on priorities that match those of the vetted companies and the state.
3. Begin running scaled demonstration as directed in individual action plans.
4. Monitor the results and report back to the state.
5. Expand the scope and/or length of the scaled demonstration as necessary.

VETTED COMPANIES

Israel is at the forefront of the sustainable management of water resources and through a partnership with the OIACI, we are working to bring innovative technology to Ohio. Many of the companies that the OIACI partners with provide original technology that have not been seen in the CleanTech industry thus far, therefore filling a need that the water and wastewater industry requires. To vet companies, the OIACI takes the following steps:

1. OIACI conducts research to identify companies that are interested in developing a presence in the US, more specifically in Ohio.
2. Companies seek out OIACI services and are referred to the OIACI by the Export Institute, Chamber of Commerce, and other relevant

- agencies. If a specific need arises, OIACI will seek out companies as well.
3. OIACI conducts independent research to ensure companies are at the forefront of CleanTech industries.
 4. Contact the Israeli Export Institute, Israeli Consulate, and the Ministry of Foreign affairs to assess the companies' viability in their current market and the companies' operations capacity.
 5. Contact academic institutions, research institutions and members of state and national organization.
 6. Contact companies directly and administer a standardized questionnaire.
 7. Have an OIACI staff member residing in Israel conduct an initial meeting and review Israeli facilities.
 8. Schedule meeting with company to tour their facilities, as well as meet members of their staff and organization.

BlueGreen Water Technologies

BlueGreen Water Technologies floating, slow-releasing algacide to combat Harmful Algal Blooms (HAB). BlueGreen Water Technologies Lake Guard™ is the first large-scale environmentally-friendly symptomatic relief against cyanobacterial blooms. Lake Guard™'s stability to direct itself to cyanobacterial concentrations both spatially as well as vertically - mandate a much lower dosing protocol, rendering it "best available practice" in comparison with all other symptomatic products. The product is effective, inert, biodegradable, has no effect on the environment, and leaves no trace in the water within 24-36 hours.

The product is approved/registered in the U.S. (National Science Foundation and U.S. Environmental Protection Agency) and by the Ohio Environmental Protection Agency. The company has a U.S. Director, Waleed Nasser, who is based in Houston, TX. The Company is currently looking for a U.S. State to set up a manufacturing facility, distribution center and headquarters. The OIACI is currently working with BlueGreen Water Technologies to continue to show the effectiveness of their product in addressing toxic algal bloom concerns throughout the state.

CHIPPEWA LAKE

Chippewa lake is one of the largest natural, inland lakes in Ohio. It was created over 14,000 years ago when glacial ice sheets melted and the lake

now spans about 330 acres.⁴¹ Several inlets that feed in to Chippewa lake have introduced excess nutrients such as phosphorous, leading to harmful algal blooms (HAB). HABs affect water quality, tourism and human health and they are detected in Chippewa lake several times each year.

BlueGreen Water Technologies has successfully treated bodies of water overseas in field tests and commercially treats bodies of water in Israel, China and South Africa. Chippewa Lake has HABs like the countries where BlueGreen Water Technologies already treats bodies of water, so they knew LakeGuard™ would be an effective solution. Chippewa Lake was the first test site in the US to use the LakeGuard™ product. It was distributed throughout the lake by the Ohio Company AquaDoc with the help of AquaDoc workers, scientists, and a boat. The total application took less than an hour.

Chippewa Lake was treated with a dose of 5.4 pounds of LakeGuard™ per acre and the treatment had a retail cost of less than \$30,000. BlueGreen Water Technologies reported a dramatic shift from the toxic cyanobacteria, primarily Plaktothrix sp, followed by Anabaena sp. The HABs disappeared and there was a shift towards an increase of beneficial green algae. Within 24 hours, all of the toxic cyanobacteria were eliminated from the water. There are no known side effects and there are indicators of a healthier aquatic ecosystem.

E.P.C. Ltd

E.P.C. Ltd is a leading provider of innovative, patented onsite wastewater treatment plants and equipment, the company's main products the Bio-Robi® and the rotating biological contactor Bio-Disk® has much to do with their success. Bio-Robi® is a novel, patented environment-friendly wastewater solution that converts domestic sewage into clean, odorless effluent for reuse in irrigation or other applications. While normal septic systems can achieve up to 60 percent reduction in biochemical oxygen demand (BOD) & total suspended solids (TSS), the effluent produced by Bio-Robi® is 95-98 percent clean. Bio-Robi® is designed for single homes, while Bio-Disk® can be used in small communities. The versatile system is especially suited to family dwellings, small communities, government facilities, gas stations and truck stops, camping grounds and trailer parks. Bio-Robi® is an ideal wastewater solution for rural areas or areas without central sewage systems.

Fluence Corp

⁴¹ www.Medinacountyparks.com/index.php/parks/Chippewa-lake-krabill-shelter

Fluence Corp's technology has great potential to significantly impact rural communities struggling to manage wastewater. Fluence manufactures aerobic, modular wastewater management solutions that are energy efficient, reduce nitrates and phosphorus in treated water, and may be used as a standalone solution or supplement to existing wastewater management systems. Fluence's line of Membrane Aerated Biofilm Reactors (MABR) are energy-saving innovative modular aerobic wastewater treatment solutions that reduces aeration energy usage by up to 90 percent compared to conventional treatment. The MABR system is cost-effective, low odor, low-noise and simple to operate, making it ideal for use in small communities. The effluent, followed by tertiary filtration can be directly reused for irrigation, industry, or can be harmlessly discharged into the environment.

The company is a global leader in mid-sized, decentralized water and wastewater solutions. Fluence stands out from the competition by: providing highly efficient packaged and pre-engineered treatment solutions, offering a differentiated product line, featuring high-quality water professionals with international experience servicing the decentralized market, and serving all aspects of the water market value chain.

GroundWork BioAg

Groundwork BioAg produces a specialized mycorrhizal fungus which effectively expands plant root systems with mycelium, allowing the plant to more effectively absorb fertilizers, thereby reducing total fertilizer application and runoff. Mycorrhizal fungi have been helping plants absorb nutrients long before agriculture even exists. However, modern agricultural methods, such as tilling, sterilization, and application of fungicides and pesticides, have deplete mycorrhiza in today's farms. Restoration of the soil's mycorrhizal balance is crucial to plants' ability to absorb the precious nutrients that farmers work so hard to provide.

Through reduction of algal-feeding nutrients entering the water system, Groundwork's technology can address the algal bloom problem seen in many of Ohio's surface water bodies, from small ponds to Lake Erie.

Utilis

Utilis developed a leak detection product that uses satellite images that cover large areas (each covers approximately 3,500 sq. km, depending on the satellite). Using a patented algorithm, Utilis can filter out the signature of drinking water and provide

these points of interest (POI) to the customer. The POIs are displayed in GIS reports, and direct the utility's own (or contracted) field crew to the areas that require search and pinpoint the previously undetected leak.

The Cleveland Division of Water, Cleveland, OH, did several field trials with Utilis technology and is preparing a contract to purchase Utilis' services to cover the whole Cleveland Water servicing region.

CLEVELAND WATER DISTRICT DEMONSTRATIONS

During 2018, the Cleveland Water District ran three different field trials with Utilis technology. The first looked at 350 miles of water main lines. Using Utilis' technology, 114 potential leaks were identified and 110 of them were further investigated using the more traditional point-to-point acoustic leak detection. The point-to-point acoustic leak detection identified 15 of the 110 potential leaks as actual leaks. The trial had a 14 percent hit rate, which was below Utilis' and Cleveland Water's expectations. Because the trial was not as effective as Utilis anticipated, the company ran a second trial at no cost to the Cleveland Water District. The second looked at 545 miles of water mains, where 138 potential leaks were identified. Of the 138 potential leaks, 24 were investigated on the ground and 15 were identified as actual leaks for a 58 percent hit rate. Utilis ran a third trial in October 2018, which looked at 702 miles of water mains.

100 potential leak spots were found, with 66 of those being investigated on the ground. 13 of the 66 were found to be leaks, creating a 20% hit rate. Overall, the trials looked at 1,597 miles of water mains and found 42 total leaks between the 3 different field trials. While the number of leaks found is low, the time required to find these leaks is much lower than traditional leak detection methods. The Cleveland Water District had previously used the more traditional methods to identified leaks in 2,814 miles of water mains, that took 18 months total. All 3 field trials, using Utilis technology, combined only took 30 days of field work. Extrapolating the combined data for the 3 trials, it would take Cleveland Water District roughly 105 days to do field work on half of their system. Utilis technology allowed the work to be done 5 times faster than traditional leak detection. In addition to being able to conduct leak detection in the entire system on a much quicker timeline, it potentially is a much cheaper endeavor as well.

Recent Activities

Over the course of the current fiscal cycle, the OIACI received funding from the Cleveland Foundation to run small-scale demonstrations. The Cleveland demonstrations are examples of OIACI's capacity, ability and experience to run and manage these types of programs for which the initiative will use H2Ohio funding. With the \$500,000 annually over a two-year period, OIACI aims to expand the scope and testing of the scaled demonstrations to be applicable across the state.

AVON LAKE

Avon Lake, OH has a water distribution system with approximately 110 miles of pipe in an 11 square mile area. There are also two major transmission lines that travel 20 to 25 miles to the south. Recently, two separate leaks have been detected in one of Avon Lake's major transmission lines. While the exact amount of water lost to leaks like these is unknown, it is nationally estimated that over 15 percent of water produced at treatment plants is lost to distribution infrastructure leaks.

Utilis, an Israeli company, is partnering with Todd Danielson, Chief Utilities Executive of Avon Lake Regional Water, and the City of Avon Lake to establish a scaled demonstration using leak detection technology that Utilis has developed. Utilis' leak detection product uses satellite images that cover large areas of the affected region. Then, using a patented algorithm, Utilis can filter out the signature of drinking water and provide these points of interest to the customer. By identifying leaks, Utilis may be able to identify failing infrastructure. This would allow the state to target septic system replacement and lead-pipe replacement by addressing the weakest points and most urgent needs.

CLEVELAND METROPARKS

Several bodies of water in the Cleveland Metroparks have been affected by algal blooms, a population explosion of cyanobacteria in water bodies. These algal blooms can be damaging to aquatic ecosystems, as well as negatively impact water quality, tourism, fishing and other recreational activities happening in the parks. Additionally, toxic algal bloom growth can threaten the safety of drinking water, and has already done so in Ohio communities. Israeli company BlueGreen Water Technologies produces a unique algaecide, LakeGuard™, to manage algal blooms. BlueGreen Water

Technologies has tested their product on several bodies of water in Florida and Texas, and more recently in Chippewa Lake in Ohio.

The company partnered with the Cleveland Metroparks and the University of Akron to evaluate LakeGuard™. The products efficiency is being compared to Cutrine®-Ultra, a commonly used algaecide for treating algal blooms. LakeGuard™ is the first product of its kind. It is efficiently integrated to achieve the lowest lethal concentration compared to the raw compound. Lakeguard™ floats on the surface of the water following wind patterns, similarly to the algae, rather than settling at the bottom of the body of water. This is more efficient than traditional algaecides as it uses only 10 percent of the material to treat the same number of algae. The scaled demonstration will conduct laboratory and field trials comparing LakeGuard™ and Cutrine®-Ultra to each other and measuring the results against a control. LakeGuard™ could be a key product in addressing HABs across the state as identified by the H2Ohio initiative.

CUYAHOGA SOIL AND WATER CONSERVATION DISTRICT

Cuyahoga Soil and Water Conservation District (SWCD) is interested in showing the value of urban land banks in the Cleveland area. There are currently over 4,000 properties owned by a Cuyahoga County land bank. Many of these are vacant lots in urban areas with poor soil quality. Justin Husher, a Natural Resource Conservationist with the Cuyahoga Soil and Water Conservation District, is utilizing a mycorrhiza produced by the Israeli company GroundWork BioAg. Their product, Rootella™, utilizes mycorrhizae (a naturally occurring fungus) to extend plant roots.

Rootella™ was originally developed to increase crop hardiness for agricultural purposes, however it was quickly discovered that this product can also extend the root systems of cover crops. They will be researching and testing if the extended the root systems improves the soil quality in urban lots. Higher quality soil in urban lots has several benefits. First, healthy soil retains more water, resulting in less flooding during periods of heavy rain fall. Second, healthy ecosystems promote water retention and nutrient cycling, enhancing overall plant health in the area. Finally, improving the land banks can create community and increase public development.

IN SUMMARY

OIACI has established working relationships with Israeli companies at the forefront of water management and wastewater treatment innovation. These companies have been hand selected for introduction into Ohio as the technologies the companies manage offer direct solutions for some of the key water management issues in Ohio. OIACI is currently running small-scale demonstration with BlueGreen Water Technologies, GroundWork BioAg, and Utilis to address localized issues. However, the scope of these trials does not match the statewide need and does not utilize these companies to their full potential. OIACI is requesting \$500,000 annually over a two-year period to run scaled demonstrations that accurately showcase the capacity of the mentioned technologies and address Ohio's water management and wastewater treatment needs.

Appendix B

Updates on H2Ohio Scaled Demonstrations as of 2/20/20

Southington & North Bloomfield

Point of Contact in Southington: Stanley Haynes, Chair of the Southington Water District Board

Information on Southington Township

- The township has just over 3,000 residents
- Is situated roughly midway between Cleveland to the northwest and Pittsburgh to the southeast.
- No central sewer, sanitary or drinking water lines
 - A \$15.4 million Blueprint Waterline Initiative project, to put in a new drinking water line broke ground in April of 2018.
 - The project is funded by the Ohio EPA, with a no-interest, 30-year loan, that forgives 75% of the cost (about \$10.6 million).
- Farm land community

Scope of the Project in Southington

Work with Fluence to install a pod-like style decentralized wastewater treatment solution for the homes that are out of compliance with their existing septic systems or have completely failed systems. They do not have an existing sanitary engineer for the township but there is a county sanitary engineer, as well as an outside engineering firm that would be able to do a study on the sewage and sanitary usage in the area. Spoke with Fluence on feasibility of the project, they told us that their systems run about \$125,000 (their smallest system) but once auxiliary costs are factored in (namely on the contracted work necessary to get a system up and running) the project could total \$500,000. Their smallest MABR system can handle 5000-6000 gallons of wastewater per day. With the factor of every person creates 80 gallons of wastewater per day, these systems could service anywhere from 20-30 people or 4-6 houses (depending on size).

Point of Contact in North Bloomfield: Roger Peterson, Bloomfield Township Trustee

Information on North Bloomfield

- Is 25 square miles and is situated in the heart of the Connecticut Western Reserve.
 - Just over 1200 residents.

- There are multiple tributaries to the Gran River which sits on the west side of North Bloomfield. These tributaries are carrying contaminated effluent to the river, which leads to Lake Erie.
- In one square miles, there are about 77 homes and 22 commercial buildings or apartments.
 - There is one restaurant with limited hours and a tavern that serves food.
 - There are two builds that are looking at opening up as commercial wineries & a bed/breakfast and a second restaurant, however current septic regulations have halted these plans.
- Bloomfield is 36% owned by non-profits or the State of Ohio, this means that over 1/3 of their community cannot expand out and does not receive any form of property taxes.
 - When property is sold, they are mandated to upgrade their septic systems, which often they cannot do.

Scope of the Project:

This project would be very similar if not identical (with room for some variances between communities) as that of Southington.

Maumee Bay State Park

Information on the Park

- Is the western most state park on Ohio's Lake Erie Shoreline
 - 1,335-acre park
- The site of Trautman Nature Center, the Maumee Bay State Park Golf Course, a 256-site camp ground, two beaches, a 24 overnight slip marina, the Maumee Bay Resort Lodge and 24 deluxe cabins.

Potential Partners

1. ODNR (need to find a point of contact within the organization still but I have reached out to Laura Briggs, who we met at the meeting with Director Mertz).
2. OH EPA – Ruth Briland, HAB's specialist
3. TMACOG – Tim Brown & Kari Gerwin
4. Daryl Dwyer, Associate Professor of Ecology & Director, Environmental Remediation & Restoration Lab, he is a Resident Faculty member at the Lake Erie Center at the University of Toledo
5. Thomas Bridgeman, Director of the Lake Erie Center at the University of Toledo

Summary of the Issues

Maumee Bay State Park is historically one of the worst areas in the region for beach bacteria, with a chronic problem that has reappeared annually. The waters at the park are often impaired due to fecal contamination of the recreational waters from a variety of sources, namely *Escherichia coli* (E.

coli). Possible sources of contamination include combined and sanitary-sewer overflow, including septic tanks, fecal pollution from birds, swimmers, or boats; and stormwater runoff. In addition, the City of Toledo's wastewater treatment plant discharges effluence into the river approximately 2.1 km upstream from the mouth.

Potential Project

There are several opportunities here in the park, including wastewater treatment for neighboring towns that have failing systems leading to the *E. coli* issue. As well as wastewater treatment for the lodge, deluxe cabins and the nature center. Lastly, BlueGreen Water Technologies to treat the algal blooms that are present in both bodies of water in the park (the inland lake and the shoreline that is on Lake Erie).

Toledo Water

Point of Contact: Ed Moore, Director of Toledo Water

Potential Project

Toledo has had major water issues for years and there are a few potential projects that may be viable in this area. They include: a side stream on their wastewater treatment plant that could be done with Fluence, or a BlueGreen Water Technologies treatment of their drinking water source or other bodies of water in the area that may have algal bloom issues.

Meander Reservoir

Summary of the Issues

The Mahoning Valley Sanitary District public water system uses surface water drawn from the Meander Creek Reservoir. The Mahoning Valley Sanitary District treats approximately 21 million gallons per day of raw water from Meander Creek Reservoir and pumps it to Youngstown, Niles and McDonald. There have been issues of harmful algal growth on the surface of the water. The MVSD is using carbon, which "acts as a sponge," to cause the algae to "drop out" of the water during treatment.

Potential Project

Amy Klei, of the OH EPA, mentioned that she would love to see how Blue Green Water Technologies LakeGuard product would work on a drinking water source. This would be a perfect opportunity to show her how effective their product could be on a drinking water source. In addition, we already

have great connections in the area that may make it easier to get a project up and running in the area.

Perrysburg

Point of contact: Alice Godsey, Public Utilities Director, Perrysburg Department of Public Utilities, City of Perrysburg

Potential Project

This was a project that Sarah Horowitz had previously worked on that still has great potential with the new H2Ohio funding opportunity. The City of Perrysburg buys their drinking water from the Toledo water treatment plant and does not have their own wastewater treatment facility. Their treated wastewater effluent is directly discharged into the Maumee River. While their current system is in compliance, they may be interested in doing a side stream scaled demonstration with someone like Fluence to further treat their effluent that is being discharged into an already problematic body of water.

Utilis

Potential Project

While we do not have a specific city in mind for this project yet, we would like to do something similar to what was conducted in Cleveland with Cleveland Water. Simply to have Utilis map a section (or the whole system) of a water distribution system and find potential leaks. Since they originally had problems with salt interfering with their results this might be a useful thing to try and “work out” in a scaled demonstration to better serve communities that use salt in the winter.

Appendix C

Project: Trumbull County Hemp

Project Description: To create a collaborative agricultural space in the Youngstown/Warren area that can be used for varying purpose, with a focus on highlighting innovative Israeli technologies. Some examples for use of the space include: growing, cultivation and processing of hemp, research for Youngstown State University, a community garden, a nursery, aquaculture, an agricultural grow center for high value crops.

Objective: To stimulate the economy in an urban environment, to create jobs, showcase Israeli innovation, and create synergistic partnerships.

Time Frame: Spring 2020, when growing licenses for hemp are issued by Ohio Department of Agriculture

Location: Warren Renewable Energy Center

Status: Privately owned, for sale by Shea MacMillian, Economic Development Specialist

Price: \$3 million

Information:

- 184 fenced and secured acres
- Four railway access points immediately adjacent to Norfolk Southern railway
- Seven 200,000 square feet warehouse buildings
- Six additional office & support buildings
- Building square feet = 1,247,740 sq. ft.
- Fenced with 24/7 security on site

Potential Partners:

- Representative Gil Blair, District 63 (D)
- Representative Michael O'Brien, District 64 (D)
- Senator Sean J. O'Brien, District 32 (D)
- Representative Michele Lepore-Hagan, District 58 (D)
- Youngstown/Warren Regional Chamber
 - CFO, Kathy Gierlach
 - President & CEO, James Dignan
- Dave Rouan, Weathersfield Township Administrator
- Trumbull County Farm Bureau
 - Organization Director, Mandy Orahood, aorahood@ofbf.org
- Area Specific Agriculture Co-Ops
- Ohio Department of Agriculture

Potential Funding:

- Ohio Capital Funding
 - Managed by Buckeye Venture Partners, with oversight provided by the Ohio Venture Capital Authority. Buckeye Venture Partners is wholly owned and managed by Washington Investment Advisors, Inc.
 - Stephen A. Baker, Managing Director, Head of Private Equity
 - Tarik Adam, Senior Investment Manager
- JobsOhio, Economic Development Grant
 - Was created to promote economic development, business expansion, and job creating by providing funding for eligible projects in the State of Ohio.
 - Is reimbursement-based and requires supporting documentation
- H2Ohio
- Warren Area Chamber of Commerce Economic Development Foundation & Warren/Trumbull County Community Improvement Corporation (CIC)
 - For information, contact Kathy Gierlach at (330) 744 – 2131, ext. 1227
- Private investors

Questions to Address:

1. Who owns the facility currently? Do we need to purchase it or lease space in order to use the space?
 - a. Are there any other facilities that would serve as a good space for this type of project?
2. We feel as though this project would be a good fit for capital budget funding, is this a possibility?
 - a. Who would complete the application for funding?
 - b. Are there other capital budget projects happening in the area?
3. We would need the other members of the legislation on board with this project, what is the best method of achieving this?
4. What are we going to do with the space?
 - a. Is it a community garden? A grow space for hemp? Other agricultural commodities? Something else entirely?
 - b. What would you like to grow in the space?
5. Does the building need to be updated or modified to accommodate this type of a project?
6. How will the product be transported or who will be responsible for transporting?
7. Who would run the facility?
 - a. Does a company already exist?
 - b. This would be a great opportunity for job creation, is this an option?
8. Would you just want to use the facility for growing? There are also opportunities for harvesting and processing of the products?
9. Who would cover the operational costs or continual cost to run the facility after the initial funding?

10. Who will be responsible for requesting the funding associate with the development of the project?
 - a. I.e. Planning grant? Capital funding?
11. Is there potential for private investors to get involved with the project? If so, who?
12. An economic feasibility study needs to be conducted on the space and project, who will be responsible for conducting this? Who will cover the cost?

Appendix D

Summary of visit to the Warren Depot on 02/05/2020

Security:

- The entire property is fenced in
- One "pedestrian" entry point, with a guard house
- Two points of entry for the rail cars/trains

Buildings:

- The buildings themselves are in great condition
 - o Cement floors
 - o Cinderblock walls
 - o Have overhead lights (would need to add additional for greenhouse growing)
 - o Sprinklers, with individual shut off valves for each 40,000 square feet space.
- Have water that runs to each of the buildings, hooked up to a sprinkler system
- The buildings are broken up into 40,000 square foot spaces
 - o The broker did mention that while all these 40,000 square foot spaces are not connected internally, it is possible to knock out a portion of the wall to create a door way in between the buildings.
- There is an office space attached to one of the buildings at the front of the property
 - o The broker mentioned that this building is likely not in great shape, would need to be gutted and redone
 - o The second floor of the guard tower could also be used as office space
 - o There is also a trailer on the property that could be used as an office space
- There is a green energy company that is looking at renting some of the space available, and would like to put solar panels on some of the buildings.
 - o This could prove as a good opportunity to make our project as sustainable as possible.
- Each of the buildings have four access doors, two that lead directly to railways and two that allow trucks to pull up to the building.
 - o This is great for transportation of product

Roads:

- There is one two lane road leading in and out of the property.
 - o The road is in okay condition, with the occasional pot hole that would need to be filled in.