SUFFOLK COUNTY WATER AUTHORITY

----------X

LONG ISLAND COMMISSION FOR AQUIFER PROTECTION

PUBLIC HEARING

----------X

October 13, 2016
6:00 P.M.

725 Veterans Memorial Highway
Smithtown, New York

B E F O R E:

FRANK KOCH - Chairman

WALTER DAWYDIAK - Suffolk Department of Health

DON IRWIN - Nassau Department of Health

MICHAEL WHITE - Suffolk Legislature P.O.

MICHAEL FLAHERTY - Nassau County Executive Representative

STAN CAREY - Nassau Suffolk Water Commissioners

JEFFREY SZABO - Suffolk County Water Authority

CHRIS OSTUNI - Nassau Legislature

DORIAN DALE - Suffolk County Executive Representative

JARED HERSHKOWITZ - Suffolk County P.O.

SARAH MEYLAND - Nassau Minority Leader Representative

JOHN MILAZZO - Attorney for SCWA

(LICAP Exhibit A, STATE OF THE AQUIFER REPORT, was marked for identification.)

MR. KOCH: I'm Frank Koch, current chairman of LICAP and also superintendent of the South Farmingdale Water District and past chairman of the Long Island Water Conference. Welcome to the first of three public hearings we are conducting in the next seven days. The other hearings are on October 17th in Mineola and October 20th in Riverhead. The Long Island Commission for Aquifer Protection was created three years ago to address both quality and quantity issues facing Long Island's aquifer system. LICAP also is an advocate for coordinating a regional approach to groundwater resource management. The purpose of these hearings is to collect public input on the topics in the Commission's draft State of the Aquifer Report. The draft report has been in LICAP's website for several weeks now, LIAquiferCommission.com. We also have copies available tonight. The public comments are an important component to the report. After evaluating the comments, we

will then be able to assimilate the points into a final total report. This report should be complete in December of this year.

Anybody wishing to present testimony should fill out an index card if you haven't done so already. List your name, title, organization, address, e-mail address, and telephone number. Oral testimony will be limited to five minutes duration. The speakers will be recognized in the order in which the cards were received. There are not many, so bear with me. You can also submit any written testimony to LICAP's e-mail address, which is LICAP@scwa.com. All comments will be recorded. Even though there are three public hearings, there is no need to testify at each one of them. They are essentially the same public hearing in three locations.

So let's start off, we have Steve Colabufo here, lead hydrogeologist at SCWA, and he has put together an executive summary Power Point presentation for the State of the Aquifer Report. Steve is the lead author of the report, he has done a great

job, we think he has done a great job, and he has a total of twenty-six years experience as a professional hydrogeologist. Steve?

MR. COLABUFO: Thank you. Can everybody hear me from here? Thank you, Frank. As he mentioned, I'm the water resources manager, I got a promotion a while back from hydrogeologist to water resources manger at the Suffolk County Water Authority, and on behalf of LICAP I'm pleased to present a summary of the State of the Aquifer Report. It's a culmination of about two years worth of work by a bunch of different members of LICAP, provides basic information on groundwater science, on water quality issues, water supply, and a whole host of other things, water related issues that are common to Long Island.

As Frank mentioned, LICAP was formed in 2013. It's main purpose is to address water quality and quantity issues on a regional basis, and secondly to represent water suppliers, political office holders, regulators, academics, scientists, civic

groups from both counties, and from all aspects of the water suppliers -- all aspects of the water industry on Long Island. This slide is a summary of all those who comprise it, and it includes all the public water suppliers of Long Island, there are over fifty. It includes Nassau and Suffolk Health Departments, Nassau and Suffolk Executives and Legislatures, the New York State DEC as well as the US Geological Survey. This slide here is kind of just a collage of all the logos of all the agencies that have participated in LICAP. If I missed a couple, I apologize, there's only so much room on the slide for logos, but it's truly a collidoscope of different water related entities on Long Island that comprise LICAP. These nine smiling faces are the voting members of LICAP. There's voting and nonvoting members. Nonvoting members include participants from numerous Nassau and Suffolk agencies and legislative bodies. Also shown at the top here are the legislative sponsors for the people that initially created LICAP back in 2013.

Early on LICAP established two initial standing subcommittees that are investigating different aspects of water issues on Long Island. I'm the chair of the 2040 Water Resources and Infrastructure subcommittee, and we're investigating long term risk to Long Island water resources. The other subcommittee, the Water Resources and Opportunity subcommittee is chaired by Bill Merklin of DMB Engineering, and that subcommittee is investigating short term issues effecting Long Island water supply. That's all going to be part of our overall groundwater management plan, which is due in about a year. The groundwater resources management plan, as I just mentioned, is the next work of LICAP after the State of the Aquifer Report, and then we'll have an investigation of about seventeen or eighteen different specific issues relating to Long Island water supply as done by both subcommittees. That includes everything from the Lloyd Aquifer to competing water uses, geothermal wells, and a whole host of other issues for Long Islanders.

That brings us to tonight's main topic, the State of the Aquifer Report. The latest draft version is available on the LICAP website, which is www.LIAquiferCommission.com. The report is a culmination of about two years worth of work so far on the part of a lot of different people. I've been the chief author and editor, but a lot of different people, agencies have contributed to it, and so I'll sort of summarize it tonight.

From the outset, State of the Aquifer Report was intended to be kind of an easy to read informative document providing information to Long Islanders about water supply community, including consumers, teachers, students, and other people who are not career water professionals like the gentlemen behind me. It includes sections on general groundwater information, water use, conservation, water quality issues, and a whole host of other things. The current draft, as I said, is available to be downloaded off the website, and we do expect people to read it or read parts of it,

submit their comments about the report to LICAP. It won't be considered to be final until we've heard from the public. So in the next couple of minutes I'll summarize the more pertinent -- yeah, I'll summarize the more pertinent aspects of the State of the Aquifer Report.

Well, to cut to the chase, early on we put in a statement about the State of the Aquifer, and the best way we can describe it I believe is as a valued natural resource for Long Islanders, it certainly faces challenges both to its overall quality as well as quantity. Fortunately a myriad of agencies that supply and oversee and regulate groundwater in general and drinking water specifically on Long Island, and they're listed briefly there on this slide, and they include over fifty water suppliers through Nassau and Suffolk Counties, both county health departments, New York State DEC as well as the US EPA. The actual report includes sections on numerous different topics as shown in this slide including the basics of groundwater, water

quality versus quantity issues, source water protection, testing and regulation of the groundwater and drinking water, and a discussion of the water quality and quantity balancing act that goes on between sewers and on site septic systems for domestic wastewater disposal. So I'll highlight some of these in the next couple of slides. We wanted to make sure that everybody who read the report knows where the water comes from, which is basically right below your feet within Long Island's aquifers. An aquifer is simply a permeable geologic formation that stores and yields groundwater, and there are three major aquifers shown here in the blue writing, Upper Glacial, Magothy, and Lloyd. There's a couple of other less extensive aquifers in the underlying parts of Nassau County, the Jamico and the Port Washington Aquifer, they're not shown in this slide, but they're in isolated parts of Nassau County. All the aquifers consist of unconsolidated sand and gravel. There's an estimated sixty-five trillion gallons of groundwater stored, we don't know exactly,

but only about five to ten percent of it can actually be extracted, but it still represents a large volume of water under our feet. All the groundwater is derived from precipitation, there's no underground rivers from Connecticut or any of that kind of stuff, it's just all from precipitation. And realizing the importance of the aquifers to so many people, the EPA designated the aquifer system as a sole source aquifer back in 1978.

There's a slide in the State of Aquifer Report about the water cycle. It's illustrated here on this slide. It includes pretty much anything and everything that could happen to water as it moves through the system from surface water to rain water to groundwater. Basically water evaporates off the surface water bodies or is transpired off of plant activities, rises -- the water vapor rises, forms clouds, the clouds thicken and produce precipitation which then infiltrates the soil and eventually makes it down to the water table. Once it's in the water table, it percolates

through the aquifer system from high elevation to low elevation, and just continues to repeat. There's no real beginning, no end. Water is in constant motion throughout the system. As I mentioned earlier, the groundwater system is recharged only by precipitation, which in this case amounts to about one million gallons a day per square mile. About fifty percent of all precipitation actually recharges the aquifer system, and we average that over a year, it amounts to about a million gallons a day per square mile. Now, potable water supply on Long Island is handled by about thirteen or fourteen hundred wells located all throughout the island. Long Island water supply is very decentralized with local supply, local distribution, and local consumption in contrast to the New York City sytem, which has distant reservoirs and lengthy transmissions, mains and aqua ducts. Everything on Long Island is about local production and local consumption. And you can see from this slide the more densely

populated parts of the island, Nassau, western Suffolk have a much more densely compacted infrastructure for water and much more intense water use pattern. Water use patterns for potable water supply is an interesting subject, and interesting phenomenon on Long Island. Between suburban landscapes and seasonal summer population, obviously greater water use in the summer than in the winter, and this slide illustrates this. This is the water use in a given day at the water authority, Suffolk County Water Authority. It's midnight, noon, and midnight, a twenty-four hour day on the bottom half, the top half shows water use systemwide at the water authority and gallons per minute. We see a couple of interesting things. This is for six particular days in 2007. You can see at 5:00 in the morning in the winter, that's the minimum water use during the day. Typically systemwide the water authority is pumping about twenty-five thousand gallons a minute at 5:00 in the morning. In summer, however, that's the maximum use during the

day, and you can see by this graphic we're pumping about four hundred and ninety thousand gallons a minute, so it's almost a twenty fold increase in water use largely attributable to lawn irrigation. Some summer seasonal population increase, but largely attributable to lawn irrigation. Even on the rainy summer day, we're still pumping somewhere around three hundred thousand gallons a minute to satisfy demand, even on a rainy summer day. So we've sort of termed this the irrigation situation on Long Island, and it's important for water suppliers because this is the volume of water that they're required to supply to meet demand, and if there's a fire or other major water use incident at 4:00, 5:00, 6:00 in the morning, it can create a significant issue in terms of public safety and things like that due to the fact that just about every well and just about everybody's system is on at that time of the day to satisfy essentially sprinkler demand. That's an example of a water quantity issue, there's also numerous water quality issues all

throughout Long Island many of which are tied to specific land uses. Since we're all living on top of our water supply, just about everything we do has at least a possibility of effecting water quantity, quality, or both. This slide illustrates the type of water quality impacts that can be expected from different land uses, kind of what I call a contaminant signature or contaminant footprint. And that's not because of some catastrophe or major spill or mishandling or something like that, it's strictly the nature of the land use. For example, in residential areas with cesspools and septic systems may yield a lot of nitrate issues and some household chemicals. Agricultural land use also may have nitrates and pesticides. And commercial and industrial uses also have their own little contaminant signature or contaminant footprint, and the shallow groundwater quality beneath these areas oftentimes reflect that contaminant footprint as we said.

The next slide kind of shows the water

quality footprint or signature for one type of contaminant, nitrogen in this case, for several different types of land use. As you might expect, agriculture has the highest nitrogen footprint of any of these land uses, typically around twelve milligrams per liter, so shallow groundwater quality in agricultural areas may have that level of nitrate in it. Other types of agriculture, like vineyards, have a much lower nitrogen footprint. And as far as residential land goes, it all depends on whether the area is sewered or not and then what the average lot size is. Obviously larger lot sizes have a much lower nitrogen impact or nitrogen signature, higher lot sizes have a higher signature. So in the case of lots of half an acre, you typically get a nitrogen footprint of about six milligrams per liter, two acre lots have a very minimal nitrogen footprint. This is for unsewered areas. For sewered area, different story, because sewage is conveyed elsewhere outside of the area where it's actually deposited, so that's a whole different story. This is for

unsewered residential land usage right here.

This slide kind of illustrates the idea of a capture zone or a contributing area to a well, and it kind of shows graphically how water from a certain specific area can get to a certain specific well. In this particular case, that shows a shallow well, and the contributing area or the source area for the water that this well pumps is shown by that red kind of blotch right there. In this particular case, the water quality to that well will be effected by land uses in close proximity to that specific well. The opposite side of the coin is shown here with deep Magothy wells screened below numerous clay units. Its source area or contributing area in this case is a couple of miles away illustrated by this grayish looking blob, and it's effected by land uses many miles away from the well, in this case agricultural land use that's far away from where the well is actually located. The travel times are indicated by these arrows. In this case of some deep Magothy wells on the south shore, the travel times might be

in the order of seventy-five to a hundred years before the water actually gets from the source area to the actual well screen. In the case of the shallow glacial well, it might be anywhere from zero to maybe ten or fifteen years. So short term, long term, and near source versus far source for its water supply. So it's very complicated based on all the different scenarios we have, so fortunately over the last fifteen or twenty years, computer models have been developed to allow us to kind of make those determinations -- allow the computer to actually make those determinations for us. It can simulate groundwater flow under a variety of conditions, and in this particular illustration, the computer models can actually generate the particular contributing area for a particular well in broad general terms. It is a regional model using regional data, not anything site specific, but it gives us a pretty good idea generally speaking where the source areas or contributing areas are to certain specific wells. This well here is in Medford, down

here is where the well is located. You can see the capture zone for the well, the contributing area does start some distance away from the well, and these are different time intervals as shown by the colored line. You have a twenty-five year time interval, twenty-five to fifty, fifty to seventy-five, and seventy-five to a hundred. And as part of a large source water assessment program that was instituted back I believe it was the late 90's, every single public water supplier on Long Island has gotten a printout like this for every single one of their wells. That's about thirteen, fourteen hundred wells, so it was a pretty extensive study that was done, but it yielded some pretty practical results. Every water supplier can determine to a pretty good approximation where the water comes from that their well pumps. The other thing that's interesting is it also does show as part of that the land uses within each of these time intervals. So water suppliers can get a pretty good idea of what potential contamination or potential issues

they may face in the near and distant future. In this case you might notice we have some commercial and industrial land use within the five to twenty-five year capture zone, so we can kind of -- you know, forewarned is forearmed so to speak, we can kind of forecast what may happen in the near future.

Now, we can marry this computer modelling technology and source water assessments to GIS, geographic information system technology, and we can kind of come up with a regional look of what's going on. The arrows here indicate existing water authority well fields. The red arrow shows the well field that I just showed the slide for. There's a whole regional area of water supply wells, and this kind of shows the capture zones of all of them pumping simultaneously under prevailing conditions. You can see how they kind of all fit together almost like fingers. It gives the water authority and any other water supplier a good idea of on a regional basis what kind of contamination issues they may face and

where they may want to target their preservation efforts in the reserve land or water quality purposes. The other thing you can see is that the capture zones do detach themselves from the well field in certain hydrologic conditions, deeper Magothy wells, things like that, and there also are some that are more conventional. There's a well field of all glacial wells, you can see the capture zone is right pretty much in the middle of where the well field is, so there are conventional and unconventional or more advanced capture zone out there.

Okay. Your drinking water undergoes a lot of testing and regulation, very extensive. All water suppliers are required by law to test at least a hundred and forty compounds and meet the drinking water standards for all of them. Some suppliers do sample from more than what's required by law, probably depending on what's going on within their districts, and some water suppliers impose their own internal standards that are actually stricter than the standards that the government, whether

it be federal, or state, or even county government make them meet. So water suppliers do have to test their water extensively, and they are regulated by numerous agencies so they don't go over certain contaminant thresholds. So there's some general water quality issues on Long Island that are discussed in the State of the Aquifer Report. I'll highlight a couple of them here. The report discusses in detail chloride contamination, and that includes lateral saltwater intrusion as is happening in parts of western Nassau, it includes vertical saltwater upconing, which is happening in parts of eastern Suffolk, and also the road salting, which is kind of an emerging chloride contamination issue. We also have sections in there on volatile organic compounds, pharmaceuticals and personal care products, which includes pretty much anything and everything you put on or in your body, nitrogen impacts for groundwater, surface water, and human health impacts, as well as sections on pesticides and emerging contaminants. So it's a pretty

extensive discussion on water quality issues, and I'll highlight a couple of these sections here. A lot of people, most of you have probably heard something about lateral saltwater intrusion. On Long Island it's happening in parts of western Nassau, this is an illustration of what's going on on the north shore of western Nassau in Great Neck and Manhassett Neck. This is taken from the US geological survey study. These lines are monitor well chloride contours, and where you can see the lines get closer together, that's where the chloride levels have increased pretty much above drinking water standards, and you can see where saltwater intrusion has occurred in those areas indicated by the stars. So any wells on land in those areas probably have increase in chlorides. Saltwater intrusion, in this matter lateral intrusion happens pretty slowly. Landward advancement of the salty water based on usually years and years of over-pumping. It's a fairly slow process. Once it happens, it pretty much is for the most part not really reversible. In

contrast to this, you've got what's going on in eastern Suffolk, which is saltwater upconing. It's happening to the water authority in Montauk, a couple of other areas, and that is more of a rapid response of an individual well to over-pumping on that specific well too high a pump rate. You can kind of see that drawing with the saltwater interface, the load screen, as the well is pumped at a higher rate, the saltwater interface gets closer and closer and closer to the screen. When that happens, the chloride levels will rise. If you back off the pumping rate, usually the chloride levels will decrease hopefully back to their original low levels. It doesn't always happen that way. In this graph here shows actual chloride versus pumpage data from a water authority well out in Montauk. Chlorides are shown by the black bars, the pumpage is shown by the white graph, and you can see early on back in 2001 or so we began pumping this well, and we pumped it at a fairly high rate, and the chlorides increased propointedly. As we backed off

the pump rate, the chlorides decreased, and then as we increased it again but to a much lower level than it was before, the chlorides to increase almost beyond where they were before that. Eventually we did back the pump rate down on this well to a point where we were able to regain control of the chloride situation here. All the wells in Montauk were actively and aggressively managed as far as the pumping rate goes to maintain their chloride levels at fairly low concentrations. The ultimate solution for Montauk is when the water authority constructed a pipeline from Amagansett into Montauk, so we were able to supply the bulk of Montauk's water from outside of Montauk and maintain the in Montauk wells at a fairly low pump rate so that the chlorides would not increase above operational levels. Another thing you can glean from this graph here, I mentioned earlier about self-imposed restrictions from water suppliers, we made sure that we did not over-pump these wells and get chloride levels more than about half of the drinking

water standard. So the drinking water standards for chlorides is two hundred and fifty milligrams per liter, we made sure we stayed below a hundred to a hundred and twenty. We knew anything more than that would result in long term degradation to the aquifer in Montauk. So there's another example of water authority, water suppliers imposing their own restrictions with the information that they have within their system.

Road salting is an interesting new twist on the problem of chloride contamination. At the water authority -- well, we know that we need to use salt on the roads to keep them safe during snowy events in the winter, but its use does have water quality implications. Now, we began at the water authority to notice increases in chloride in noncolitical (phonetic) areas. We also eventually discovered that road salt had a different chemical signature, slightly different chemical signature than salty groundwater or ocean water. So more intense investigation of some of these higher

chloride wells, we were able to separate out the impacts within road salt, or intrusion, or upconing. Also what the water authority did was set up a cooperative study with the US geological survey. We set up a realtime road salt impact monitoring station out in Peconic. It was a shallow monitor well that is positioned at the entrance of all the storm water to a drainage sump that is on County Route 48, which is the main drag out in Peconic. It drains about a half mile or a mile of that road, and during snow melt events you can see how the specific conductance of the water spikes up pretty high. Specific conductance is just a measure of how much dissolved material is in the water, in this case, sodium chloride from road salt, and typical groundwater is in the five hundred to a thousand range in its specific conductance. You can see here that during snow melt events in 2014 we had a few hits of fifteen thousand to twenty thousand in conductivity. As the snow melted and we went into the summer, the well might have even dried up, I'm not sure, we

didn't get -- just background levels of five hundred to a thousand, and then as winter came in again last year we started getting these spikes of fifteen thousand or so, but we did have one spike close to forty thousand, and that was pretty interesting because the conductance of sea water is fifty thousand. So for one brief moment in time, the water entering this drainage sump had -- was almost as salty as ocean water. That goes to show you a couple of things, we use a lot of road salt around here to keep those roads safe, and the point being -- the real greater point is that any activity on land, no matter how beneficial or benign or seemingly benign does have a water quality implication. So things just don't go away, they're out there in the environment, and they do effect groundwater and possibly drinking water and other environmental resources out there.

Okay. Volatile organic contaminants or volatile organic compounds, VOC's, are also discussed at great length in this report. There are two main treatment techniques for

volatile organics. Carbon adsorption is shown here. These are twelve foot diameter vessels that contain a carbon medium, carbon media which is sand size grains of either anthracite coal, or coconut shells, or some very carboniferous material. The carbons ink out the contaminants as the water goes through these vessels and exiting out the bottom as contaminant free water that can then be pumped into the distribution system. And every year, two years, three years, the medium is changed out, replaced with fresh medium, and the cycle starts all over again. Another technique for volatile organic chemicals or compounds is packed tower aeration or air stripping. In this particular case, water is pumped to the top of this air stripping tower, it's allowed to cascade vertically downward through this packing material which is, like, plastic material that serves to break up the flow of water. It exposes it to air, which is blown up by a fan up through the bottom, so the water cascades vertically down, the air is blown vertically up, and the air actually

strips out or removes the contaminant from the water. The contaminants with the air are then vented into the atmosphere or recovered and treated with a secondary granular activated carbon adsorption system. And both of these are used extensively in Nassau and Suffolk Counties, and the State of the Aquifer devotes two or three pages to volatile organic treatments.

Okay. An interesting tool that LICAP has developed is known as WaterTraq, and it's a software program that allows anyone, any user to map water quality issues throughout Long Island. It's actually up and running on the LICAP website as we speak. This is just a quick example of one type of inquiry that anybody out there can do. In this particular case, we've highlighted public supply wells that have had nitrate levels above the drinking water standard of ten milligrams per liter in 2015. So of the fourteen hundred public supply wells on Long Island, ten of them had at least one hit of above ten milligrams per liter in 2015. The table here at the bottom

mentions what each water supplier did to remediate that situation. This is just a page taken right out of the State of the Aquifer Report, so you can find this in the report just by looking.

There are several pages in the State of the Aquifer Report dedicated to describing the differences in both water quality and quantity that result from the use of regional sewers versus the use of cesspools and septic systems. This slide shows the area of municipal sewers in Nassau and Suffolk County. You could see it's kind of, like, a tale of two counties. Nassau County is about eighty to ninety percent sewered, Suffolk County is only about thirty percent sewered. Fully seventy percent of Suffolk County residents rely on cesspools and septic systems for wastewater disposal, and so there are some interesting water quality and water quantity issues that result from that. The next two slides kind of describe that. I focused here on shallow creeks because they are reflective of the groundwater conditions in the vicinity of

them. You can see here, this is Nassau County, the eastern Nassau County, Massapequa Creek, and you can see as sewering kind of took hold, the actual quantity of water, the discharge of Massapequa Creek has declined over time, pretty significantly too, but the nitrate levels of that water in Massapequa Creek have also declined similarly down to single digits from above drinking water standards earlier in this period of record down into single digits. So that's typical of what happens in the sewered areas. Lowering the water table reduces the quantity of the water in the shallow glacial aquifer, but in some ways improves the quality of it by removing nitrate and other waste products from the groundwater system. Now, the Carman's River in eastern Suffolk tells a slightly different story. This is in a lightly populated part of Suffolk County served all by cesspools and septic systems, and here you can see as a bit of a contrast, the discharge of the Carman's River has maintained -- has stayed stable. We know

it's fluctuated a lot, but it stayed stable over time, no real upward or downward trends, but nitrate concentrations have inched up over time because of the use of cesspools and septic systems. Even though they're still pretty low, single digits, nothing like what you saw from Massapequa Creek, there's still a noticeable upward trend in nitrogen concentration in the upper glacial aquifer in the vicinity -- well, within the Carman's River. So it's reflective of an overall trend of using cesspools and septic systems for wastewater disposal.

There's a couple of sections in the -- well, one section about three or four pages in the State of the Aquifer Report about the Grumman Navy Groundwater Plume. This is important to residents of Nassau County. This graphic shows the extent of actually two different plumes it looks like in the Grumman Bethpage area. It also shows the direction of groundwater flow. The blue flags you see there are public supply wells in the vicinity, and you can see that

several public supply wells are sort of in the thick of the plume, more than likely are being effected by it now. There's a couple of wells down in the lower left that seemed to have pulled the plume in its direction. It looks like without that it would have continued in the direction of the arrows there, but those four well fields seem to have sort of pulled it towards them. And there's a few more well fields that look like they will be threatened in the near future by this Grumman Navy Groundwater Plume. So we devote about three pages to a description of that within the State of the Aquifer Report.

And then finally there's a discussion in the report about pesticide contamination in groundwater. It's mainly a problem in eastern Suffolk County where there's still a lot of agricultural land. A lot of people may be surprised to find that historically at least Suffolk County has been the number one county for agriculture in New York State based on the dollar value of the crops grown. I think we have since fallen to

number three. I think the yogurt industry in the southern tier has brought us down to number three, but it's a lot of agricultural land still in use in Suffolk County, twenty thousand acres, and that productive agricultural land does come with a water quality string attached. About half of the water authority wells that serve the north fork are on some type of treatment for pesticide contamination. Briefly earlier I mentioned nitrate issues on the north fork too, and eastern Long Island where there is a lot of agriculture is also an area where there are a lot of people being served by their own private household well for water supply. So there are public health issues associated in those areas with nitrogen and agricultural contamination, such as pesticides, so it does represent a significant difference in public health issues out east versus on the west end where we are.

So we can conclude with this: So the quality of your public drinking water is excellent, meets and exceeds all federal or

state standards, but Long Island groundwater in general and drinking water more specifically does face some challenges from both past and present land use activities that have impacted water quality and quantity. Some impacts have affected drinking water resources, other impacts haven't affected drinking water resources, but have affected environmental resources, ecosystems, lakes and streams, so even though they're not a public health issue, there may be an environmental related issue, so they still need to be addressed. Specific contaminants out there may also present potential health risks for drinking water, and we mentioned organics and pharmaceuticals, and nitrates, and even saltwater to some extent. Fortunately, public water supply is required by law to meet the standards for all those contaminants, and they do. LICAP was formed with a main purpose of addressing thee quality and quantity problems on a regional basis and trying to effect solutions to them. So anyway, on the last slide here

I've got the web address of Long Island Aquifer Commission. There's also the State of the Aquifer web page maintained by the US geological survey, and that web address is shown here as well, as well as addresses, e-mail addresses, and phone numbers if you do want to submit comments after this meeting is over.

With that, I'll hand it off to Frank here, and we can continue on with the meeting.

MR. KOCH: Thank you, Steve. I've been remiss, I apologize to everybody up here. If we can go and introduce ourselves, the LICAP members. We'll start with Don and go around the horn.

MR. IRWIN: Don Irwin, Nassau County Department of Health.

MR. SZABO: Jeff Szabo, Suffolk County Water Authority.

MR. KOCH: Frank Koch, Long Island Water Conference.

MR. CAREY: Stan Carey, I'm the rep for the Nassau Suffolk Water Commissioners Association.

MR. FLAHERTY: Mike Flaherty, Nassau County Executive's office.

MR. WHITE: Michael White, I'm representing the Suffolk County Legislature Presiding Officer.

MR. DALE: Dorian Dale representing the Suffolk County Executive.

MS. MEYLAND: Sarah Meyland representing the Nassau Minority Leader.

MR. HERSHKOWITZ: Jared Hershkowitz, Suffolk County Presiding Officer rep.

MR. KOCH: Okay. Does everybody that wants to do a public comment, did they fill out a card? I take that as a yes, and then we'll start this ball rolling here. When you get up to the podium, just state your name and if you have an affiliation, please state that as well. Mr. Paul Granger?

MR. GRANGER: Good evening. My name is Paul Granger, I am currently representing both Long Island Water Conference and the Port Washington Waster District, and I appreciate the opportunity to address this board tonight. My comments tonight will strictly focus on water quantity,

conservation, and efficiency measures. Myself personally have been in the business for twenty-eight years involved with engineering and management of water supply. I'm currently the superintendent of the Port Washington Water District, and I serve as the chair of the Long Island Water Conference legislative committee. I certainly appreciate the support of the Nassau and Suffolk County legislature and executives for creating LICAP. The entity certainly represents the first real step to a bi-county cooperation for aquifer protection and management. Also I'd like to thank the volunteers for consisting of local experts and stakeholders who serve on the LICAP board and those who have participated in the meetings and report preparation and review. A lot of work has gone into the State of the Aquifer Report, and Steve Colabufo, very nice job with the presentation.

It is estimated that Nassau and Suffolk County together have approximately sixty to sixty-five trillion gallons of groundwater,

which sounds like a lot, but the water stored within the aquifer system is drainable to about five to ten percent of that, that's roughly three to six trillion gallons. So while there's an abundance of groundwater beneath Long Island, judicious and efficient use is key to its sustainability. Therefore safe pumpage must be maintained at quantities far below recharge in order to preserve these outflows and keep the entire hydrogeologic system in tact. It is vital that the facts and real science of our water supply be obtained and be objectively considered when assessing our groundwater system on Long Island. At present, there is no shortage of drinking water on Long Island. However, because of changing and more extreme climate conditions, proactive planning and implementation of sustainable measures to reduce water use will ensure that future generations within the community will have safe and adequate supply and reasonably priced drinking water. I don't know too many people who when they open up their

water bills have a heart attack. When I get my LIPA bill at the end of the air-conditioning and swimming pool season, it's enough to make you fall over. That's one of the beauties of Long Island, high quality water, low cost. Unfortunately when I took the job in Port Washington in the beginning of the year, the Port Washington peninsula is experiencing saltwater intrusion, which makes it a challenge, and my job is not boring. Therefore in my case water conservation is a vital water resource management tool for water payers such as myself and other suppliers that are adjacent or on the peninsula. In addition, it's important that science based permissive yield pumpage values be developed for each county and region subject to saltwater intrusion. I understand that the USGS is doing some good work in this, and I hope it continues.

Another area just to point out as we wind down from the summer and approach fall and now we're going into winter, outdoor water use and water system leakage are

really the biggest contributors to water use inefficiencies and loss. On Long Island, as Steve pointed out, average water use during the summer more than doubles compared to winter usage and sometimes triples depending on where you're at. Therefore lawn irrigation is a practice that should be targeted in an attempt to prevent annual water demands and continue to increase in the future. I understand that Nassau County legislature is considering a progressive legislation to address that with regard to the regulation of irrigation systems and using technology to be more efficient and sustainable. So proper design operation of automatic irrigation systems are vital to the efficient use of the resources. It is important at this time to implement a proactive approach at the local level, that we use science and expert knowledge to address current and future water supply concerns. Adequate and sustained funding is important to ensure that proper monitoring of our sole source aquifer or existing regulatory framework can be maintained.

We recognize that the groundwater supply on Long Island is vast yet it's finite. Vigilance and care must be undertaken by a regional supplier to ensure that the groundwater supply beneath Long Island is high quality and ample quantity and to provide the present and sustain the present and future population and obviously do it at a cost effective means. I appreciate your time, consideration, and if you do have any questions I'll certainly take them. Otherwise, thanks again.

MR. KOCH: Anybody have any comments or questions? Thank you, Paul. We call Suffolk County legislator Sarah Anker, please.

MS. ANKER: I want to thank you for coming here, you're in my territory, and it's nice to see some familiar faces. Sarah Anker, Suffolk County legislator. My district is the sixth, and again, I want to thank you for providing this opportunity for public hearing in regards to Long Island Commission For Aquifer Protection 2016 draft State of the Aquifer Report. I believe that

the State of the Aquifer Report is the first of many steps towards assessing the long term health of Long Island's sole source aquifer and forging a path forward to preserve our water quality for future generations. It is critical that Long Island continues to focus on improving our water quality and adjusting our policies by working to improve our existing infrastructure. I commend LICAP for identifying that are significant water quality data gaps and a substantial lack of comprehensive water quality information for Long Island. I encourage LICAP to continue to work to focus on their primary objective to create an all-inclusive database and island wide monitoring program in an effort to close those gaps and help to draw more informed conclusions about specific water quality threats.

LICAP's first State of the Aquifer Report helps to outline the importance of the actions we take everyday and their impact on our groundwater. The comprehensive report summarizes the

formation of our aquifer, where our water comes from, water quality testing, and the strict groundwater regulations that have been adopted by federal, state, county, and local municipalities to further protect our environment from pollution. As a Suffolk County legislator representing the sixth district, I greatly appreciate LICAP's efforts to address water quality issues on Long Island, and I look forward to our continued working together and our partnership. Again, I just want to point out a couple of points that the fact that, you know, our water, it's a limited resource. Once it's polluted, it's almost impossible to clean up, especially what we're seeing right now. You know, I just read an article about illegal dumping, another issue has popped up in Brentwood, now we have an area over in I believe it's Commack. You know, there are so many components to understand our water, and that's what you basically have outlined in the groundwater resource management plan, and I do want to thank your time and your

effort, you know, to address these problems. And also consider a very important point is synergistic effect. So we have a lot of things getting into our groundwater as we saw during your presentation, and from the new chemicals to nano technology, you know, the synergistic effect is important to consider. I know that you test on certain chemicals, actually hundreds of chemicals, but there are thousands of chemicals out there, and I know Sarah, you know, we discussed this before. So that is a very important point. I just came from the Suffolk County Soil & Water Conservation District Committee, I'm one of the board members, and I also want to emphasize how important our agricultural communities are, that they're out there, they're producing crops, they're supporting our local economy, and, you know, we're working hard with grants, Cornell Extension providing educational outlets so our farmers can reduce pesticides by, for example, using cover crops, conserving the water. So, you know, feel free to reach out to the Soil &

Water Conservation District and Cornell Extension as we help our farmers address some of the issues that have been presented with pesticide and also water conservation. So again, I do want to thank you again for focussing on this. We still have a lot of work to do, but like I said, this is the start, and I look forward to working with you as your Suffolk County legislator. Thank you.

MR. KOCH: Thank you for your support, Ms. Anker. Anybody else have any questions or comment?

MR. DALE: Legislator Anker, thank you for bringing up a very salient point. In last week's meeting with Clean Water Alliance, this particular point that you brought up was I think coalesced in a consideration of what the cocktail of these constituents -- components -- contaminants rather would conceivably be. That's another level at which we have to engage and evaluate these various contaminants, not just separately, but how they are working in concert with one another and what that net

effect may be.

MR. KOCH: Thank you, Dorian. Richard Murdocco, I hope I said that right, he's representing The Foggiest Idea.

MR. MURDOCCO: Good evening. My name is Richard Murdocco. I am the founder and publisher of The Foggiest Idea, and am a land use columnist who writes professionally on regional real estate development issues. I am here this evening to share my perspective on the Long Island Commission for Aquifer Protection's State of the Aquifer Report.

My published work on a variety of land use topics that impact Long Islanders appears each week in the Long Island Press as well as in Newsday, The Real Deal, Long Island Pulse Magazine, and on-air on CBS 2 New York. My work is widely read, blah, blah, blah, boiler plate.

State of the Aquifer Report lives up to its name, from naming the linkage between land use and water quality, the changes climate change will bring to our water table, to the marked need to curb excess

consumption in the coming years, the report accurately outlines many of the threats our groundwater faces.

Moving forward, however, it's essential that this panel does not get mired down in the buzzword-driven planning efforts that I've seen so many other environmental efforts in the region fall victim to, such as the creation of the supposed "smart growth" projects that are not located near transit hubs or "sustainable" projects that do not incorporate LEED standards in their design.

It's the job of this commission to be a fierce advocate for water protection at a time when some elected officials on Long Island love calling for an expansion of sewer infrastructure without taking into account how such systems will impact water table and future developmental trends. At a time when there is a rising call to relax local zoning standards to allow for more residential density, this commission must be the rational voice that urges elected officials and developers to balance their

need for economic growth with the carrying capacity of this aquifer.

The commission's recommendations must be grounded solely in environmental science and work to make realistic policy prescriptions that ignore the ever-present desire present in this region for economic growth to trump environmental necessity. I look forward to working with LICAP in order to ensure our drinking water is protected from its biggest enemies - political shortsightedness, industry greed, and at times, Long Islanders themselves.

And just as an aside from the written comments I'm submitting tonight, it is important that we look at what happened in West Hills County Park and realize that that is a special groundwater protection area. It's one of the higher geographic points on the island, the groundwater absorption is higher there, and now there is I don't know how many truckloads of debris that was dumped, but that plume should be monitored carefully. The question is that this commission hopefully will get the resources

from county government will be if the commission could examine if there are other cases that impact our aquifer unknown. It's happened in Brentwood, it's happened in West Hills, and it sure as hell will happen again. Thank you very much.

MR. KOCH: Thank you, Mr. Murdocco.

MR. WHITE: Just a question, are you aware that there is a groundwater contamination plume from those materials in West Hills?

MR. MURDOCCO: One would assume if there's contaminants that's been dumped over an extended period of time, given past precedent, it's safe to say, but of course, unofficially we do not know, we have to run studies, but we must act, and your body must act on the assumption that if there was construction debris, whatever it is they're finding there, it will impact the groundwater in some way. As the presentation said, even if it's a "benign" use, it impacts groundwater. I'd be happy to -- any other questions, comments?

MR. SZABO: I would just like to point

out to Mr. White, the dumping situation in Islip with Roberto Clemente Park and I believe there were some others, Babylon, Islandia, that was part of the Suffolk County Water Authority's coverage area, distribution area, and we -- since 2014, we've done quarterly testing to determine if there have been impacts within the wells that we have, and there have not been any negative impacts. We sent that information quarterly to elected officials, to community activists, to the district attorney, to the State DEC, to the State Health Department. I believe the area in question today, South Hills County Park up in Huntington is part of the South Huntington Water District, and they would have to, you know, conduct some testing to determine if it's impacting any wells up there. The greater concern may be if there are folks on private wells in that area, and I would hope that they would get -- reach out to South Huntington Water District and the County Health Department to get their wells tested, but I think the water providers and the County health

Department when these dumping occurrences occur, when they happen, clearly we were very proactive to monitor and ensure that public health isn't jeopardized.

MR. MURDOCCO: Well, would it be within the scope of this commission to explore who exactly are still on their own private wells and maybe put educational materials out to them and say these are the benefits of municipal water supply at a time when a private well operator does not have the resources to constantly monitor and ensure the safety of their drinking water. That may be worth exploring especially in the more rural areas out on the forks.

MR. SZABO: We support the idea. I'm not sure if it's an appropriate issue for this commission to look at long term, but certainly I think everyone, if I could speak for the entire commission, they support and certainly the County Health Department support getting people from private wells onto public supply, that's something I think we all support very much.

MR. WHITE: I would also say in my

experience from at least one person from the Suffolk County Health Service this year that the department has been extremely aggressive in communicating with private well owners, and available testing information, so I think that's a great recommendation, but we should be sure that continues.

MR. KOCH: Thank you, Mr. Murdocco. We have one more card, and that's Mr. Paul Pontoro.

MR. PONTORO: Good evening. My name is Paul Pontoro. I'm currently a senior water resource engineer with H2M Architects and Engineers in Melville where I worked for the last eight years following a thirty-six year career with the Suffolk County Department of Health Services Office of Water Resources. I want to thank you for the opportunity to speak with you this evening, and I want to congratulate the LICAP board on the successful completion of the first State of the Aquifer Report and the successful initial demonstrations of the WaterTraq GIS basic water quality management system. I look forward to seeing it expanded, and I

think the two together will be important public resources during the ongoing discussion of water supply and management issues on Long Island.

This summer the state legislature held public hearings on water quality following the findings of perfluorinated chemical compounds, or PFC's, in public water supplies starting in Hoosick Falls and the City of Newburgh. Some PFC contamination problems have been associated with the use of firefighting foams and training exercises at military air bases. Investigations associated with foam use at Gabreski Airport in Westhampton and a national Department of Defense study at its own airfield are currently underway. This prompted a broader public discussion of unregulated contaminant monitoring, which included calls from both the commissioners of New York State Health Department and New York State DEC and a number of legislators calling to expand EPA's UCMR or Unregulated Contaminant Monitoring Rule program to include smaller public supplies and develop a response

mechanism for monitoring individual private wells for both regulated and unregulated contaminants.

I'd like to focus my comments today on issues of unregulated contaminant monitoring, UCMR's -- EPA's UCMR program and its limitations and possibly what role LICAP could play in these discussions. EPA's UCMR authority is strictly limited under the safe drinking water act. EPA cannot require more than thirty contaminant candidates to be sampled during each five year cycle of contaminant nomination, sampling, and data evaluation. As a result, selected UCMR analytical methods are not optimized to include all possible analytics available for these methods. The SCWA prohibits EPA from requiring sampling from systems serving under ten thousand people. Finally, UCMR is intended to develop data on contaminant exposure and not to determine the presence and extent of contaminants in untreated source waters. While source water monitoring is not needed in order for EPA to decide on whether or not to regulate a

contaminant, a more complete picture of contaminant occurrence in source waters is critical in assessing and protecting source water. Arguably this last round of UCMR monitoring did bring to light unregulated contaminant occurrence that has not received adequate prior consideration. However, several examples exist which illustrate that a strong local program of unregulated contaminated monitoring by health departments and water suppliers brought to light other serious contamination problems, which otherwise would have worsened over the years. The first one, I think most of the people in the room are familiar with MTBE. This gasoline additive was first detected by Suffolk County Water Authority and the Suffolk County Department of Health Services Laboratories in water sources in 1991. EPA did not require sampling under UCMR until ten years later. Under the New York State Sanitary Code, an enforceable limit of fifty parts per billion was immediately effective for MTBE, and this informed New York State DEC's groundwater remediation of detected

spills. The New York State drinking water standard was later reduced to ten parts per billion, and a statewide MTBE ban in gasoline was initiated in 2004. Water suppliers on Long Island successfully pressed for satisfaction of claims against MTBE manufactures. EPA has yet to make a determination on whether or not to regulate MTBE. A second group of examples exist relative to Aldicarb and some other pesticides. In 1979, water quality results indicated the presence of the pesticide Aldicarb and its breakdown products. By mid 1980 over eight thousand water samples were collected by Suffolk County Health Services from public and private suppliers. This led to the development of an approved analytical method by Suffolk County DHS began a process of assessment of water soluble pesticide use on Long Island. Cooperative programs with other laboratories and manufacturers including the Suffolk County Water Authority and use restrictions of certain pesticides. Aldicarb, herbicide dacthal, and 1,2,3 Trichloropropane are examples of pesticides

that were identified in private and public supply wells by about 1982. All three eventually were included in federal unregulated sampling programs in 1993, 2001, and 2013 respectively. EPA has not adapted drinking water regulations for any of these pesticides.

So here are my concluding points: The first one should be obvious to everybody. EPA's UCMR process is slow and inadequate in assessing the state of our groundwater resources. We need a local ongoing unregulated contaminant monitoring program. It should be driven by assessment of contaminant chemistry, use, and storage practices both present and past. Any laboratory performing such analyses must incorporate laboratory QA/QC, quality assurance, quality control procedures, the New York State protocols for State approved water and environmental laboratories. This is critical in order to ensure the public including analytical findings. It's been demonstrated that local resources can be utilized effectively to demonstrate and to

keep water quality assessment current and meaningful, and to also address the needs of small systems and private well owners. These are, again, we're probably talking about between private well owners and small water systems that solely exist on Long Island, probably about two hundred thousand people. So I maintain it's not inconsequential, while I don't take exception to the statements made about public water supply being extended to everybody wherever possible, for all practical purposes it will always be very difficult. When I started with -- when in first report I found on private wells that was issued by Suffolk County Health Department the estimate of private wells was fifty thousand, and Suffolk County was much more rural. Suffolk County is not more rural now, but the total number of private wells is forty thousand, so in terms of what can be done, you know, the magnitude is still surprisingly there. That's not to discourage anybody from extending public water.

So what can you do? I main that LICAP can be a strong advocate for maintaining a local response capability and can work to help in areas of coordination and optimization of unregulated contaminant monitoring activities and more importantly or equal importantly data sharing. I want to thank you for giving us the opportunity. I look forward to seeing things progress over the next year and look forward to the final report. If you have any questions, I'll be happy to answer them.

MR. CAREY: Thank you for your comments. You certainly have a lot of experience in the water industry, and we welcome all your input. Just so I understand correctly your comment, to summarize, you think that LICAP should perhaps provide input to EPA on the selection process of contaminants for UCMR rounds?

MR. PONTORO: I think that's always something that should be done, and it is currently being done certainly by the public water supplier members through the Long Island Water Conference and through American

Waterworks. More importantly, I think it's important to recognize that there are some real fundamental flaws in the process, and to -- and while the objectives are different for the UCMR process in terms of source water assessment and will always be unless the safe drinking water act changes, I think it's important to recognize that we really have to maintain something totally independent of that in order to properly assess our resources. I think while we would always hold out hope that the safe drinking water act can be made better, I'm at the point now that this would require congressional action, and I don't see that happening any time soon.

MR. KOCH: Paul, so you're talking about a Nassau Suffolk Groundwater UCMR program?

MR. PONTORO: Well, and what I've maintained is that historically something along those lines have existed historically between primarily driven by the two county health departments and voluntarily by the Suffolk County Water Authority and other major water suppliers in cooperation at

times with other entities. When the pesticide program got off the ground, we were very much reliant on the Suffolk County Health Department working with cooperative manufacturers and to some extent -- I'm not to naive to say the regulatory environment was different in 1979 than it is now, still the point is that the mechanisms for cooperation, any and all mechanisms for cooperation have to be utilized, and quite frankly, at least in the beginning manufacturers voluntarily pulled their products when we found them. So I think we have to look at any and all possibilities and keep open to that.

MR. KOCH: Dorian?

MR. DALE: Thank you for your contribution, Mr. Pontoro. This isn't quite as overarching as my colleagues in terms of policy, but you did bring up MBTE, which was furious from my standpoint, but as I recall, if my memory serves, there were ninety-seven established MBTE sites on Long Island, many of which have subsequently been remediated or dismissed by -- and I believe the Suffolk

County Water Authority actually was the recipient of settlement with MBTE. So, in fact, while perhaps it hasn't been regulated out of existence, the market has seemingly banished it. Can you help me out? I'm not really sure of the update --

MR. PONTORO: I think it's fair to say that MTBE in gasoline products has been removed so that in that sense a potential source of continuing contamination, whatever, by spills or failed tanks has been stemmed. The number of spills greatly -- the number of spills greatly exceeded ninety-seven, and we've seen in terms of groundwater quality a fairly significant -- what I would consider a fairly significant response, but I think it would be a mistake to say that, you know, we all know that the groundwater moves much more slowly and we'll be stuck with --

MR. DALE: I understand the prevailing and preexisting legacy issues, but I'm just curious as to what sources there conceivably would be at this point in time that would be subject to some kind of regulatory

constraint?

MR. PONTORO: In terms of drinking water sources?

MR. DALE: No, in terms of the actual, you know, usage of MBTE in some way, shape, or form that would be constrained by regulatory at this point in time after the fact?

MR. PONTORO: I think that the issue mainly is that we have regulations in place that protect the public. I'm pointing out that EPA has never reached the point where they actually did take actions, and as a result, no common federal standard -- no common national standard exists, and, you know, admittedly the process has now effectively stopped in terms of evaluating that contaminant.

MR. DALE: But the point is that it's come to a de facto end?

MR. PONTORO: Yes.

MR. MILAZZO: There's a New York law banning the sale of MTBE.

MR. PONTORO: Yes.

MS. MEYLAND: Just a point of

information, I believe they still sell gasoline with MTBE in it in New Jersey.

MR. PONTORO: I know in some municipalities it's still in use.

MR. MILAZZO: Not in New York, in New York it is banned.

MR. KOCH: Thank you, Paul.

MR. WHITE: Thank you, Paul. I want to say I had the honor of working with Paul years back in the Department of Health Services, it may have been the early 80's, and he's a great mentor, and obviously still really offering a lot.

MR. PONTORO: We've both gotten gray.

MR. WHITE: Yes, we did. But we're still here fighting this battle, and I want to say thank you. And I also want to on a content note that I think that Paul has identified a really serious gap in our regulatory scheme with respect to drinking water quality protection, and I think we should really keep this in line with as we move forward in our next task in terms of the management plan that this could be a really key action item that we'd like to

take forward for consideration.

MR. PONTORO: I'm trying very hard to give you a sense that from experience this is an area where we really have to pull ourselves up by our own bootstraps. You know, you can't -- I think experience has told us that you can't really rely on a federal response in such a way as to without having major problems occur. There may be federal roles to play, but I think we have to have a real boots on the ground approach to understanding land use, the chemicals that are in use, the properties of those chemicals, and to evaluate those potentials in the context of prioritizing what unknown or unregulated compounds do we choose to continue to look for. And I think we've got to because I think we've seen that we've got to continue because as long as there's chemicals out there we've going to have problems.

MR. WHITE: Thank you very much.

MR. KOCH: Does anybody from the audience that did not fill out a card, would you like to comment now? I will make a

motion to close the public hearing.

MR. WHITE: Second.

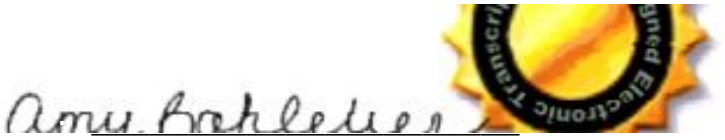
MR. KOCH: Thank you.

(Whereupon the meeting was adjourned at 7:10 p.m.)

C E R T I F I C A T E

I, AMY BOHLEBER, hereby certify that the within Proceeding was held before me on the 13th day of OCTOBER, 2016.

IN WITNESS WHEREOF, I have hereunto set my hand this 13th day of October, 2016.



AMY BOHLEBER