AGENDA: CSO PHASE III STAKEHOLDERS MEETING

NARRAGANSETT BAY COMMISSION

DATE: September 4, 2014
TIME: 9:00 A.M.
PLACE: Narragansett Bay Commission
Corporate Office Building
One Service Road
Providence, RI 02905

PRESENTERS:

MIKE DOMENICA, MODERATOR
TOM BRUECKNER
RICHARD RAICHE
NICK ANDERSON

STAKEHOLDERS:

ANGELO LIBERTI
PHIL HOLMES
DORIS ASCHMAN
CHRISTIAN CAPIZZO
STEVE SCIALABBA
AMES COLT
DAVID TURIN
MICHAEL WAGNER
SHEILA DORMODY
BRIAN BISHOP
JOHN HART
JAREN RHODES
MIKE GAGNON

AL MANCINI
HAROLD GADON
TOM BORDEN
JAMES BOYD
GREG GERRITT
MICHAEL WALKER
JAN REITSMA
KEITH GARDNER
STEVE COUTU

OTHER ATTENDEES:

JAMIE SAMONS
KIM KIRWAN
TIM THIES
GAIL DEGNAN
SHERRI ARNOLD
KATHRYN KELLY
NANCY KELLY BEATON
MATT TRAVERS
CHRIS CRONIN
ELIZABETH SCOTT
JOSEPH HABEREK
PAM REITSMA
CHRISTINE COMEAU

(HEARING COMMENCED AT 9:10 A.M.)

MR. BRUECKNER: Welcome back after the summer. That was a great summer, and I hope you all had a wonderful summer. Parking lot issues are usually the first item. The summary of the minutes are on the website, and the only parking lot issue that was addressed last meeting had to do with the issue of future precipitation projections and I mentioned that NOAA what is currently updating those projections and they'll be available for September 2015 and will be used for those designs of the Phase III facilities.

The next item is that we have gone through the slide presentation for today. It's a very good presentation talking about alternative analysis, but we realize that we're not going to have enough time with just one more meeting to cover all the issues we need to get to a recommended plan. So we have made a decision to add a Stakeholder's meeting, and we're shooting for November 13th, the tentative date for that meeting, and we'll send a notice out, but hopefully everyone can make it for November 13th. It is our intent that that will

be the last meeting, and at that meeting we'll be presenting a recommended plan.

The last item I want to mention is that Phil Holmes has asked if he could speak on issues effecting shell fisherman, water quality issues effecting shell fisherman. So we have reserved 10 minutes for him at the end of today's presentation. That would be at 11:50, we'll end, and then Phil would just like to take a few minutes and talk about these issues. And there is on the table a handout that Phil has prepared, which is a summary of those concerns for the shell fishing. With that I'll turn it over to Mike.

MR. DOMENICA: And I will turn it over to Rich with one more reminder, if you would, please, also state your name as you make comments. That would be appreciated. With that, I'll give it to Rich.

MR. RAICHE: And I'm speaking into my mike. My name is Rich Raiche from MWH, for the record. Thank you all for attending today. I thank Jamie for sending out all the reminders to everybody. We have a pretty full agenda, a

pretty important meeting. I thank everybody for

your patience thus far as we've been talking about a lot of technical issues. We will be speaking to a few more technical issues today, but I hope that today winds up being gratifying because we're going through the alternatives now because we're really starting to shape the plan that we've been talking about that's very abstract levels so far. So just to give you a road map of what we'll be talking about this morning. And as always, we'll start off with a little review of where we are in the Stakeholder process. We'll talk about the summary of the alternatives development screening, you know, sort of the work that fell out of our first June meeting. We'll discuss where we landed on the evaluation criteria which was the focus of our previous meeting and your homework, then we'll discuss the CSO needs analysis.

Potentially, we're going to talk about the hydraulic model that you know we've been working on, which lets us know what it is that we need to accommodate. And finally, we'll wrap up the pre-break session with a discussion of the subsystem delineations. Our objective

for today is to look at subsystems. We're

breaking down the overall Phase III plan into manageable chunks that we can look at alternatives for, and that's what the second half of today's meeting will be about, the alternatives evaluation by subsystem. What we hope to do through this process is vet out some of those alternatives, eliminate them, so that we can get this down to a more manageable sort of evaluation going into October.

So again what we did in April and May, was look at how do we develop these alternatives? We said any one of these systems, any one of these technologies can be adapted and designed with the community in mind, and that was the input that we were looking to go get from everybody in April and May, understand what these systems have to look like to fit into these communities.

In June we then talked about the evaluation criteria, what is it that we want to measure these alternatives by. Today we'll be talking about again, taking the technically feasible alternatives that we have developed up

front and applying the rating criteria that we discussed in June to then determine what the

individual component of a Phase III plan should be.

Now in October, what we plan on doing is once we have a better idea of what individual components are, we then look at how we put them together, essentially making, we envision three different Phase III scenarios, putting these different components together and getting configurations to really evaluate the benefits and cost of different Phase III programs. And then as Tom just said that in and of itself a probably ambitious enough agenda for October. And so what we want to do is add a November meeting to then finalize and refine that plan. So, again, we'll start off with the alternatives screening.

In April or May we talked about what the different CSO mitigation strategies are. We introduced the idea of source pathway receptor. Source solutions are those that are very close to where the rain falls. Those are stormwater controls, and are green stormwater infrastructure. And then pathway solutions are

sort of ones that are sort of within the pipe network. So we're looking at stormwater

storage, sewer separation, regulator modifications which we'll be talking a little bit about today which are at the CSO point and what the force flow through the existing pipe network to other locations where we can deal with this a little more effectively, and interceptor relief. And Nick will be speaking to this a little bit when we talk about the model results. We're finding that a lot of the CSOs aren't necessarily driven from the catchment that immediately the upstream of those individual CSOs, that a lot of it is driven by the interceptor system itself. It's the interceptors, as Nick has eloquently has said, the CSOs as Nick has eloquently said before, are sort of release valves on the pipe network, and we're finding that they're functioning exactly as they're supposed to be to keep the levels of service within the pipe network reasonable, so we're not backing up into people's homes, but we are discharging to the waters.

And, finally, the receptor-type

mitigation strategies which include treatment and discharge. We've also been using the term "screening and disinfection" and I tend to use

those interchangeably somewhat. Near surface storage which are CSO tanks.

And, again, just to make that distinction, up on top, we've got stormwater storage. Those are often basins, or they can be tanks that store exclusively stormwater which is relatively clean.

The receptor-type solution are tanks that hold combined sewage, so it's relatively dirty and you need additional facilities there to control odors and clean out the tank. So I hope no one has epilepsy looking at this chart, but this is intended to give you and idea of where we wound up after we had those April and May meetings, we went through the various different solutions and figured out what would be technically feasible for each one of these areas?

So in terms of source control, GSI is technically feasible throughout these sewer sheds. At our last meeting we had a little bit of discussion around what would GSI look like.

And we made an attempt to determine where our stance would be on implementing GSI and the public right-of-way versus on individual pieces

of property.

Now, you are trying to control the stormwater as close to where the rain falls is possible, so ideally, you do that on private property before it gets into the right of way. There are institutional problems with that. So what we've done is we've segregated the public way and private property GSI. We're carrying them both forward as alternatives. We kind of came to the conclusion that if there's work that can be done on private property and it is cost-effective to do it, then NBC would negotiate with the property owner to see if it's a viable project for NBC to execute on that piece of property. But there are certain institutional considerations that we need for that. So what we're doing is carrying them forward just as separate categories because they're administratively different.

In terms of the pathway we have the sewer separation, which, as we've said before,

in terms of implementation based on the Phase II experience is probably less preferable from an implementation standpoint, but it's still technically feasible so we can carry it forward.

We had talked about hydraulic control and water storage again. Technically feasible for a couple of the areas, particularly as alternatives to sewer separation. There are other areas where we simply don't have enough data to determine if it's technically feasible to do, like, in a lot of the Pawtucket collection system.

So it would be something that we could look at further on down the road as sort of a subset of GSI. But we don't really have enough data right now to say that it's something we can look forward. Regulator modifications, again, it's system modification to get flow elsewhere. Generally, these things are feasible. There are a few locations where they're a caveat, and this is something that you'll hear a few times as we're evaluating these alternatives. The CSOs at any particular location may be influenced by flow that's already in the pipe upstream of that location.

So, you know, one thing that is very easy to understand that I kind of have you put a visual check so the check with the little circle around it. A regulator modification is technically

feasible for 202, if they're doing something else for the flow from 201, because we've got an interceptor that goes on 201, 202, and then crosses underneath the Blackstone River by a siphon, and then continues on down through the interceptor system. If you do something else to relieve the flows of that 201, then a regulator modification at 202 is technically feasible.

If you don't do that at 201, it won't work at 202. So we kind of have these triage of feasibilities.

Interceptor relief: Now, this is something we looked at specifically for 039 and 056. As you recall, that's on the Branch Avenue interceptor. The Branch Avenue Interceptor we've discussed has SSO problems, sanitary sewer overflow problems. We're looking to also solve that problem if we can. And interceptor relief on a complex system getting it over to the Moshassuck River Interceptor would work, so it's

a provisional check for interceptor relief to the Pawtucket Stub Tunnel. There's simply more study we need to do. The hydraulic model is telling us if we relieve Branch Avenue in one location, problems pop up elsewhere just because

of the steep slope on it.

Nick will speak a little bit to this. But there's more study that we need to do to say definitively that we can relieve Branch Ave to Moshassuck River. Interceptor the other form of interceptor relief we're looking for at that location is the West River interceptor, storage interceptor that is technically feasible.

Skipping over satellite treatment discharge for a second, near surface storage again, feasible for most of our locations. The stub tunnel that I just spoke about is feasible for 220 and of course the Pawtucket Tunnel is feasible for a majority of our outfalls.

The satellite treatment and discharge is something that, again, we give it a provisional check. The previous Stakeholder process concluded that chlorination and dechlorination, which is at the time the primary

means of disinfection, had several drawbacks.

Most notably, you need to handle and store chemicals throughout the system, essentially in neighborhoods. So that was seen as something we didn't really want to do. And

the second chlorination dechlorination has the potential for having toxic residuals that after you apply the chlorine, you still have some residual chemicals that then get discharged to the water body, that again, is seen as something that is disadvantageous.

Since that time, UV, ultraviolet disinfection has gained technical feasibility. However, we don't really know enough at present about the water that's coming in, the CSO volume that's coming in to make a definitive determination to say, yes, we can do it and/or it's cost-effective versus other alternatives. Essentially what we need to do is additional testing, so that is a provisional check. So where we land on satellite treatment or screening and disinfection is that right now we've got insufficient data to make a definitive determination. Because the effectiveness of

ultraviolent is that the ultraviolent light rays have to get through the combined flow and the light rays have to hit the bacteria to kill it. There's a very large variability in the properties of combined sewage. So if it's cloudy you're not going to get the

effectiveness. If it's relatively clear, you can. We would essentially need to do about a year's worth of data collection at these outfalls to characterize the flow that's coming in to determine what our level of treatment would be.

MR. DOMENICA: Mike Domenica. A quick question on that. Is this just pure disinfection, or is it treatment and disinfection.

MR. RAICHE: Well, let me step back for a second. So where we're looking at screening and disinfection as sort of a sub-alternative to near surface storage. There are several locations where the land available for near surface storage is limited. And the footprint of a screening and disinfection facility would be smaller than the tank. So that would get us around a site constraint and

make satellite discharge a viable option.

Now, that actually, it's almost like we planned this. UV typically requires pretreatment. Because, as I say, you need the light to be able to go through the water for it to be effective. Often screening is not

sufficient to get the water to appoint where that happens. So very often you need pretreatment. That adds to the cost, both capital and operations cost, but it also increases the footprint, which then may make it unviable based on site constraints.

Now, these are things that we would have to study essentially we would have to do the water quality testing for about a year, maybe even do a pilot study to determine what that treatment chain looks like. Again, nothing we can determine right here right now. We would have to do additional study. Now, again the chlorination and dechlorination -- Brian?

MR. BISHOP: I think you kind of lumped chlorination. You mention other chemical alternatives underneath, I notice. I mean, chlorination for anybody who's looked at its use

involves things that range from direct chlorination, you know, to elemental chlorine-free approaches, chlorine dioxide, other. I mean, you're looking at other approaches besides the peracetic acid possibly using derivatives of chlorine but not in a typical approach. It may be that I'm more

familiar with this in terms of paper making, and so forth, where I've dealt with some of this. So I don't know what the direct applicability of what I know there to the sewer treatment.

MR. RAICHE: Again, I think we're in the realm where we don't know the quality of our influent, nor do we know precisely what our effluent limitations would be, so we would be in a category where we would need to do additional study, even pilot testing.

So we're not in a position right here right now to make that determination, which then leads me to the next point; is that there would be regulatory issues with any of these facilities, because essentially, there would be satellite treatment facilities, and which would be discharging effluent, and so we would be you know, essentially in a realm where we would need

a permitted discharge for those. And what would the discharge limits be, and what would the water quality implications be. So I may want to yield the floor for a second to Angelo. If he wants to speak to, you know, at least where he currently thinks we are in that process.

MR. LIBERTI: Angelo Liberti from

DEM. I guess I would say from all the alternatives the most difficult one from a regulatory standpoint is going to be screening and disinfection. Because as you mention, whatever the disinfection is, it depends on pretreatment to be effective and reliable.

And so in the big scheme of things here, I think unless everything else is unaffordable, it doesn't seem very likely to me that the, you know, screening and disinfection of any kind is going to rise to the top as an acceptable alternative. Either there has been some national lawsuits on bacteria limits, in particular, it's been sort of a long-standing EPA "policy", I guess that bacteria needs to be met at the end of the discharge. That you aren't allowed to set a mixing zone in the

receiving water because it wouldn't meet the mixing zone regulations. And there's been a successful challenge to that not being promulgated as a rule. So there's still some national uncertainty on how you would set the limits, but, basically, I would say, you know, this would be the most difficult alternative to approve, and in my opinion, I think it would be

only if other alternatives that are more effective and reliable and not deemed affordable.

MR. BISHOP: Only to reflect, I think that's genuine and not intended to, you know, necessarily say because these are alternatives on the table to consider. But I notice that, for instance, from an institutional perspective Tom has pointed out that sewer separation which may rate higher on DEM's idea of what could work rates way lower from their institutional perspective on what could be possible. And in these areas where there's extreme constraints on storage, you know, I certainly don't want to necessarily see, you know, I mean, I think the original Stakeholders broke a little bit of ground, and it may

occasionally be our responsibility to break ground in these areas even if the cost and size of the facilities is such that we consider them to be potentially temporary low-cost investments for some gain that in 20 years are going to be rolled into a different kind of solution as the technologies come along.

MR. BRUECKNER: I just want to make

one comment. With regard to both sewer separation and screening disinfection, I think our concern is water quality, meeting water quality. Because I think as we mentioned before on sewer separation, while you eliminate a combined sewer overflow, you are creating a stormwater discharge which does have bacteria and bacteria is the main thing we're trying to control with the CSOs.

So I think we're looking at the alternatives being more positive with regard to the aspect of control of the bacteria.

MR. BISHOP: Again, Tom, can you remind us the extent to which NBC owns the stormwater discharge in its service areas. It's just so we understand from a ratepayer

perspective.

MR. BRUECKNER: Well, we don't own any of the stormwater discharge unless it's combined with the sanitary flow in a combined sewer overflow. But strictly stormwater discharges that come out of a separate stormwater pipe, we don't own any stormwater discharges.

MR. RAICHE: In terms of overall

cost, what we're looking at on the horizon is that any new stormwater discharge would become the responsibility of the member community. In this case, there's three, four for Providence, and one for Pawtucket. At present, there is movement on the EPA national side to start to regulate those stormwater discharges. We don't know exactly what it's going to look like, but what we would be doing if we create these new outfalls, stormwater outfalls, is potentially creating a financial and water quality liability for the cities. One final.

MR. REITSMA: I just want to back up, Brian, and ask that we go through the process, sort of step by step. We were on technical feasibility. So to jump ahead and say

from a regulatory perspective we want to rule this out already, I think is not proper. Let's deal with technical feasibility, then we get to cost, I presume, then we get to other considerations. I think that helps us all sort of deal with the issues, I think, step by step. Thanks.

MR. RAICHE: One final approach to talk about is wetland treatment, which was

something that had been brought up before, and is actually being implemented as part of Phase II.

Wetland treatment is another type of treatment that is land intensive. Most of our outfalls are in very dense urban areas, so we don't have the land available to implement that. There were a few locations that do have some open space near them, you know, 035 and 039 being one of them, with sort of the banks around the West River.

However, most of those areas are either flood zone or already wetland, which makes that land sort of ineligible for us for wetland treatment. In order to do wetland

treatment, we would need something that is already upland, so isn't already classified as wetland, and out of the flood zone, because we don't want, you know, if we're discharging combined sewage into this low line area, we don't want mixing the flood waters and spreading, essentially.

So what we have in essence are no viable sites for, you know, that land intensive approach. So that's where we wound up after

sort of the technical feasibility screening. Now we'll jump to the evaluation.

MR. REITSMA: I just don't want to be the one issue person. But I do want to bring up sort of the climate change issues from a technical perspective. To what extent have you considered for some of the issues that involve site considerations, projections about flooding not based on historic flooding data, but projections as to how climate is changing and intensity, and frequency of storms maybe changing, not only in coastal areas, but inland areas, as well, because I think that could be critical, as well.

MR. RAICHE: Yeah, and well,

actually leads very well into the evaluation criteria. We have qualitative judgments on those, and essentially, it feeds into two of our evaluation criteria.

MR. COLT: The basis for the technical feasibility analysis, just briefly, what were the overall criteria that you were using to make those judgements in the matrix?

MR. RAICHE: Largely they were site constraints. And in the second half of the

presentation, we'll be going through the technically feasible ones, frankly, a lot of them are largely technically feasible. And we've got drawings of them. So, you know, it's really more site constraints, elevations, you know, things along those lines.

MR. DOMENICA: Rich, quick comment. There's a refreshing little dialogue or comment that Mr. Reitsma made, and I agree with it very much, but it also relates to Mr. Colt's question about the criteria. One of the criteria of these, I presume this is a question. I presume that it meets regulatory requirements. It can be designed to meet regulatory requirements,

correct?

MR. RAICHE: There are rating criteria.

MR. DOMENICA: To be technically feasible, they have to do the job that has to be done.

MR. RAICHE: Yeah. I'm going to slide in a little bit specifically to that.

MR. DOMENICA: And one of the reasons I mention this point is while we don't want to bring in criteria that are not technical

criteria right now, to me it was refreshing for Angelo to speak up and say this is where the regulators would come out like this, and this may not be approvable, probably won't be approvable. And I think that's nice to here from a regulator at this stage, because oftentimes that doesn't come out until you design it. So while we want to have discussion and we want to stick to the point, I think, that is just one point I would make. Brian?

MR. BISHOP: It seemed to me that he essentially qualified where something was marginal either from an engineering or a regulatory standpoint which is why he invited

Angelo to come or what I heard Angelo to say is that our consideration would depend on the affordability of the alternatives. So in other words, he didn't say it could never be approved, he said, you know, from a regulatory standpoint, that would be like the last tier. We may get to the last tier in places when we get that far.

MR. DOMENICA: I'll ask Angelo to comment on that. Was it an affordability issue, or is -- or would DEM --

MR. LIBERTI: I think they're

setting me up.

MR. RAICHE: Here's some rope, Angelo.

MR. LIBERTI: I guess to me this is all going to come down to affordability. That's where CSOs end in my opinion when all the dust settles. And so effectiveness is big here, because, you know, there are real concerns with screening and disinfection as to whether it's effective. My opinion is that it's going to be the least effective of all things. Green infrastructure, storage. So, you know, my guess is it will be the east effective. So to select

the least effective, Brian brought up a good point, may go into it saying we know it's temporary and we know it might be changed in the future. So, you know, as for my general impression, I would say it would be the most difficult, it could still be on the table.

MR. DOMENICA: Well, that's good. Because what I'm hearing you say is that it technically could be designed to meet criteria, regulatory criteria, but compared to other alternatives, it's probably far down on the list, which is different than saying you

wouldn't permit it, it's different than saying you would not permit that. You're not saying you would not permit screening and disinfection.

MR. LIBERTI: No, I really don't think you could do that. At this point in the process, I really don't think from a regulatory standpoint you can throw out anything. We're doing a really cursory screening in the beginning, just taking into account is there no way it would technically work? And regulatory-wise, a bunch of factors come into whether or not that's acceptable. So I would say that everything stays on the table unless

it's you know --

MR. DOMENICA: Okay, good comment, Jan.

MR. BRUECKNER: Just one other comment on screening and disinfection. When we did the first stakeholders, we brought up that in Atlanta. They had gone to a fairly extensive program for the CSOs of providing just that treatment at a number of their overflows which included disinfection. And the City of Atlanta was taken to court by a citizen's group who contended that the facilities did not meet the

permit requirements. And the federal judge agreed with the citizens and said, your facilities don't work. You've got to do something else. Because they were not meeting the bacterial standards at the end of the pipe, at the end of the treatment facility. Atlanta has since gone to a tunnel system, storage system, and other alternatives to address their CSOs, so the regulatory issue that Angelo refers to is very real, has happened elsewhere, and it would just be a big concern of ours that we build something, realize after we built it that,

you know, that we're having violations all the time and it doesn't work, and we've got to do something else. So I think that's a real concern of ours, and with screening disinfection.

MR. TURIN: It's good discussion. I'd like to, you know, agree with what Angelo said, and I thing Tom's comments are also important to note. The other thing I would point out is that the screening and disinfection would not likely be, you know, it's not an elimination of the CSOs. You know, you're still having discharges.

It's not meeting minimum requirements of the Clean Water Act that you provided, at least secondary treatment, so even if it can be permitted in the short term, the Narragansett Bay Commission would likely have to come back as they pay off, you know, other loans and continue additional alternatives in order to achieve the ultimate objective of the elimination and complete treatment of any of those discharges. So, in addition to, you know, Angelo's very good comment with regard to, you know, the general difficult piece and issues

about the clarity and whether you're going to be able to get, you know, just disinfection effectiveness, sufficient for short term permitting and compliance, I want to, you know, point out that you're also kind of kicking the can down the road a bit with regard to, you know, complying with the Clean Water Act.

MR. DOMENICA: Not to distract us, but that was a very, very important point that Dave just made. And what he's saying is that the CSO discharges even from a screening and disinfection facility has to meet secondary treatment. And that may need some explanation,

Dave, as the CSO policy says equivalent primary treatment.

MR. TURIN: Again, that's under the CSO policy, so that's not complying. If you're trying to eliminate the CSOs and you're trying to get out underneath that policy like you're trying to eliminate CSOs and providing, you know, full secondary treatment, which is not --

MR. DOMENICA: So what you're saying is that combined sewer overflows are combined sewer overflows even if you meet the

bacteria solids and BOD. But if you don't get biological treatment. So biological treatment of remaining CSOs is required by EPA?

MR. TURIN: So the primary equivalent requirement is for treatment of the CSO. And as long as it's a CSO, then you continue to fall under that kind of cycle of continuing to assess affordability as to whether you can do more.

MR. DOMENICA: That's a very, very, very interesting point. I've been away of the interpretation of the CSO policy for a while, and it's been changed quite a bit.

MR. REITSMA: I do need

clarification of how we're going about this. I'm not any way defending this particular technology or strategy, but if it's your position that as a matter of technical feasibility, we now need to consider this not feasible, then let's say so, let's take it off the table. Because that's what we seem to be doing. I'm confused by the presentation. It should not be on the list as technically feasible if I follow this discussion, otherwise, we seem to be mixing up the presentation and the

discussion, and I'm a very simple person. I have a hard time following discussion. We either take this as technically it's still feasible, and when we get to another evaluation criterion we take it off the table then, or we do it now, but let's keep things simple.

MR. DOMENICA: I agree.

MR. BRUECKNER: Yeah, I agree also. The reason that we have it here is to show that we're looking at it, and that this particular alternative is one that is kind of dicy from the standpoint of meeting water quality criteria. But also, I think I'm with Mike. What Dave said wasn't my understanding also of what we were

required to do, my thought was that if this facility could meet the bacterial discharge limits, it would be good.

So, I think it's good we're having this discussion because we're learning some things, and based on what's just been said, I'm thinking this alternative is more dicy than it was before.

MR. BISHOP: So it does seem that we're getting, at least for this alternative,

we're having the debate now rather than later. And I don't think that's wrong if we're trying to prevent ourselves from wasting time with it.

I think the point that I made actually almost goes directly to what Dave -- I had no idea that was the regulatory take on it, but it seems not only from a space constraint, that if the Atlanta situation points out says that they weren't meeting the bacteria limit. So the issue was not the failure to eliminate a CSO, it was a question of whether or not the technology actually performed.

MR. DOMENICA: Well, not quite, because yes on bacteria, but what Dave's saying is that even if it met the bacteria limit, it

didn't meet the biological treatment.

MR. BISHOP: I understand it's still a CSO, and they might say you have to do more and all I said in my discussion is from a technical standpoint, I would like to see if that technology can be inexpensively or relatively inexpensively implemented at the most difficult -- I mean, we're talking about a minor number of sites that are the most difficult to serve, or would be the most expensive to connect

with hard infrastructure.

So the concern that we might have three or four remote CSOs that are served in some interim standard by this, I would argue that Atlanta water quality was still probably a little better when they had that running even if eventually they had to do something else. So that's why I'm saying that we don't see that put in theory. It could be a possibility for everyone of the CSOs, I mean, theoretically, and it's only up there for a few. So I think there's been some natural sorting and I certainly wouldn't want to push it away as a technology for these difficult ones where the alternative is, you know, 30 mile siphon tunnels

over and under five neighborhoods, you know, for one remote CSO.

MR. DOMENICA: One comment. I think that what EPA, what Dave said is very important. Because what he's saying is you can do screening and disinfection. It will improve water quality to some degree. You may be able to meet bacteria standards, you may not. That's the question. But even if we do that, it's

still a CSO. It still violates the Clean Water Act. And if you're really looking at the overall program, you need to include the cost of ultimately going back to that CSO and putting in secondary treatment, or getting it to a wastewater plant or Fields Point or Bucklin Point that does secondary treatment.

So that the full cost of your CSO program, if we consider some of these alternatives, is really not what we're looking at. The full cost is even an addition to that, when 10 years later they come back and say, well, now, we want that CSO out there in the remote part eliminated and brought to secondary treatment or create a stormwater discharge which I'd ask then if it's the Clean Water Act as the

stormwater discharge have to go through secondary treatment if it has anthropogenic bacteria or other things, but nevertheless, but what we're looking at it here is really not the end of the road, it's really secondary treatment period.

And that is a different interpretation of the CSO policy, than I was ever used to, and Tom is familiar with that, as

well. So I think we have a regulatory issue here. I don't want to distract our meeting. I've already done that, I guess.

But this is a key issue to understand exactly what we're putting in place and whether it actually meets the Clean Water Act standards or not, including the CSO policy which has been codified. So if we could move on here, there's one comment by the City of Providence we'll take.

MS. DORMODY: (Inaudible).

MR. RAICHE: So essentially, where we're looking at is -- the site would be at near 205 and would treat the low 200 series. That's essentially the front street site along the Blackstone River in Northern Pawtucket. The

other cluster is a similar site. Actually, there would be two; one would be near the tidewater site to do 217, 213, 214, Seekonk, Pawtucket. The third would be near 218, which is just north of the Bucklin Point Treatment Plant, so basically on the Pawtucket East Providence border. And the final one is that outlier location that we have been talking about

all along, 220, which is over on the Moshassuck river.

MR. DOMENICA: But basically, Rich, what we're talking about here is anything under the satellite treatment and discharge would be screening and disinfection.

MR. RAICHE: Correct. We eliminated a number of the other sites based on neighborhood constraints.

MR. DOMENICA: Well, I'm not talking about site, I'm talking about technology. That technology, according to the discussion we just had, would not meet EPA requirements.

MR. RAICHE: Correct, regardless of where you put it. It simply speaks to Brian's point, and it's almost sounding though as if it

would be an interim solution to improve water quality until a permanent solution can be effected. And, you know, just the locations we're talking about are, you know, downtown Pawtucket, an area of Pawtucket that the city wants to revitalize another area for revitalization on the other side of Pawtucket near the Moshassuck River, and the area in

between Pawtucket and East Providence.

MR. DOMENICA: Okay, I think we better move on, but thank you.

MR. Richard: Okay. Everything else, and actually we can even evaluate screening and disinfection using our evaluation criteria. Last, or in June, we talked about how to evaluate all these alternatives, and we talked about what we've come to call the triple bottom line where you analyze alternatives based upon environmental benefits, economic impacts, but also social benefits with the idea that, you know, if something is positive for all three of those categories, you have a sustainable solution. During our discussion on criteria under those categories, it was actually Caroline's observation at first, but other

people agreed that there were a couple of criteria that were important to the group that didn't fit neatly into any one of those three categories. So we created a fourth category, which is awkwardly entitled implementation, but, you know, it's just another category of criteria.

Now, this isn't unheard of. Baltimore did a similar thing, and they had four criteria and even more awkwardly tried to brand it as the quadruple bottom line. That aside. So we had the discussion in June and sent out homework, and I thank everyone. We had a very good return on the homework, and we compiled everyone's responses to that, and everyone replied both for the criteria that they felt important, and weighted the criteria and also weighted the categories. So if we just look at the high level the category weighing, the environmental and economical categories were the most highly weighted by in the homework by the Stakeholders.

Of course, environmental one category is the highest rated, which, of course, is why we're all here. If we didn't have sort

of the environmental benefits from eliminating CSOs we probably wouldn't be talking about it. So it makes sense that that rate's high. And, of course, the economic impact, how to pay for it is also very high in everyone's mind. The social implementation issues, again, got some support, but slightly less.

So to look at the environmental criteria first, in the homework, every single one of the criteria did get some interest from someone. But it just becomes unwieldily to rate with all of the criteria. So we had to pare some out. So for the water quality was specifically the toxics and exotics was not widely supported. So we're not going to carry that forward as an evaluation criteria and the nonaquatic environmental impacts, you know, like heat island and carbon sequestration also was not rated highly. That isn't to say that some of those benefits aren't being considered because we do have them under the social criteria as co-benefits, but we're not carrying them forward as environmental criteria.

So the four that we are bringing forward are water qualities, specifically as it

relates to bacteria. Again, why we're here talking about CSOs bacteria is the primary reason, so it's weighted most highly, followed by flooding risks and water quality associated with nutrients, which is a little bit more associated with the stormwater component of the

CSO flow. And finally, scalability and adaptability.

Now, the scaleability and adaptability, this is where -- you know, I'm talking to Jan's. One of the areas we were talking to Jan's issue. This is specifically the ability to increase or modify flow handling or treatment capacity to accommodate future water quality requirements or design storm intensities. So this is a category where we can rate favorably or unfavorably for any one of these technologies. That in the future, once we've built it, we can adapt it. Either to different water quality needs, or if the analysis proves that, you know, we are in a regime where we have more intense storms, how we can associate it with climate change or precipitation characteristics. How we can adapt that to changing conditions.

This is going to be suddenly different from the other criteria, so I just want to sort of belabor that point a little bit. The second economic criteria, not surprising, capital cost, being the highest rated from the responses in the homework, operations,

maintenance cost, also. Three other categories that gained some support in the homework that are worthwhile carrying forward are constructability and construction phase risks. You know, constructability, what we already know about what these alternatives are, how difficult it is to construct. But the construction phase risk touches on some of the uncertainty.

Again, we're designing or looking at conceptual designs at a very high level, and there are a number of unknowns that we have to deal with; contaminated soil, or things like that. That we simply do not have enough data to understand. So we want to carry that forward as an evaluation criterion to possibly weigh some things a little unfavorably to reflect the fact that there are risks that may increase costs, or essentially increase costs. Anything can be remedied with money.

Cost per gallon. This was a criterion that was used in previous Stakeholders engagements. Again, this was sort of a bang for your buck criterion that we're bringing forward with a low weighting. An operational

flexibility for optimization. Now, this is again suddenly different from the scaleability and adaptability. This is a criterion where we look at the ability to modify the system performance to meet water quality goals without requiring capital projects or system alterations, or additions. It's how inherently flexible the system is. Not necessarily adapting to climate change, but just a recognition that just some things won't necessarily perform as designed, and how we can modify operations to meet design objectives. Sort of a little bonus for things that are a little bit intrinsically inflexible.

Social criterion: We're very happy that shell fishable. Shell fishable is --- waters was weighted highly as a social criterion. And this directly related to the water quality, as well. The co-benefits quality of life, this is really spring from the idea.

Particularly, green infrastructure as seem as sort of urban improvements in the neighborhoods that, you know, you've got the heat island reduction, and essentially, beautification of urban streets, or at least in some people's

opinions, with the additions of tree boxes and vegetated swales in the streetscape. So we've got the co-benefits as a social criterion. Operations and maintenance impacts and construction phase constructions. These are impacts to the neighborhoods and streets where we're building these things, either the acute impacts during construction, or the long-term impacts during operations.

And finally, our implementation criterion, our fourth category; administrative and institution considerations: Now, particularly, you know, when we talk about sewer separation, it's fairly direct. As we just said, if we separate the sewers, the city then owns the stormwater discharge. So that from an institutional standpoint is fairly understandable. When we talk about GSI, and particularly GSI on private property, it gets a lot more complex, and this is why we wanted to

make that distinction up front between private property and public way, GSI.

In order for these things to be long-term control strategies for CSOs, they need

to be maintained properly. And if you have a piece of GSI on private property, it's a little bit more difficult to -- with certainty know that that is operating correctly. Moreover, who does that maintenance? Does the property owner do it? Does NBC do it? These are not things that we were able to bring to resolution. We talked about it quite a bit over the past couple of meetings. We're not going to bring it to resolution, so it's an uncertainty factor at this point that we're carrying as an evaluation criterion.

System reliability and robustness, again, sensitivity to change and conditions. It's suddenly different from the other operational issues. And then finally climate change and resiliency. This is specific disaster recovery, where we had those other criterion that was focused right at the location, how well it operates, how flexible it

is for itself. This is a criteria that evaluates, you know, what if super storm Sandy hits us here, and let's just say for argument sake, one of the two treatment plants gets

knocked offline, and we are in an emergency recovery situation. This is a criterion that evaluates our newly built infrastructure and its capacity to provide interim treatment, some interim level of protection to the waters while that disaster recovery is taking place on already built infrastructure. So again, it's suddenly different, but worth having it as a criterion.

MR. BISHOP: Just a point of word or I'm going to dissent from the idea that hurricane Sandy had anything to do with climate change. I don't think that's appropriate.

MR. RAICHE: I can say and/or recovery. How's that?

MR. BISHOP: Okay.

MR. RAICHE: So this is the grand result of the homework. So again, we rated the criteria and rated the categories. So if you multiply the two, we get two weights for each one of the criterion on their own, and so this

factor column adds up to a hundred percent. So we rate each one of the alternatives against this and multiply out by our factor to get a

composite score. So we use that today for the alternatives evaluation and selections. So today we're looking at subsystems and alternatives and which technical approaches are most appropriate for each one of these locations, so we apply these today to make that determination. In October and November, we use these same criteria to rate what will then be system components of an overall plan to then help us prioritize which piece of infrastructure should be built before another piece of infrastructure. Now that is in absence of the affordability analysis. So those two things kind of go hand in hand. What can you afford to do and what is priority to do from all these various other reasons.

Now, as we had talked about before, there is the integrated planning framework that seeks to look across programs. So what we're talking about today and in October and November, are just CSO projects. We know that as we move on down the road, there are going to be other

projects. Stormwater improvement projects, sanitary system improvement projects. And what we are attempting to do is establish a

repeatable process, so that as we look to implement this program over time, and if we want to in four, five, ten years down the road reevaluate the priorities, and put stormwater projects and sanitary sewer projects up against the CSO projects, and redetermine what the overall priorities for the region are, given that it's all the same ratepayers paying for these projects, that we should be able to evaluate other projects with these same criterion, and get an overall environmental and dollar priority scheme for the region, for the whole region, service area.

So, you know, not to belabor it, you know, we score each one of the alternatives against the evaluation criteria on a 0 to 10 scale, 10 being good, 0 being bad, 5 being neutral, essentially. And for the second half of this morning, I just wanted to give a little example of how this works, both today, and as we move forward.

So today, you know, we'll be

looking at subsystems. So, for example, our 205 subsystem, we've got three alternatives for that

subsystem. We've got the, essentially, the tunnel alternative. We've got a CSO tank alternative, and as we were just talking, the screening and disinfection. So what we have done is populated the scores. And the scores for environmental criteria and cost and implementation criteria, those are sort of technical determinations. And while we can have some discussion around what those scores are, you know, really, those ones are associated with technical implementation of each one of these alternatives. Where we really want to have the discussion this morning is around the social criterion. That has a lot more to do with the community. We have gone in there and put sort of provisional scores based upon our understanding of what we have been hearing over these past five meetings. But this is really where as we go subsystem by subsystem, really want to have some discussion with you who know the community best on, if we need to modify those. For each subsystem, we come up with ratings.

Now, what we won't be talking about today are capital costs. We don't quite have

the capital costs refined to a point where we're really comfortable with rating one against the other. So what we're focusing on are the non-cost criteria today. So putting costs aside, you can see that for 205, if you look down at the bottom at the composite rating, the apparently preferential approach is the drop shaft to the tunnel, scores are higher.

You know, the similar analysis up on the right is for 039-056, where we've got sewer separation, hybrid GSI and the West River interceptor. The apparent winner there is the West River interceptor. So those are the sort of the evaluations that are the objective for today, make a subsystem by subsystem basis. Let me just finish this head of steam. Assuming that those are the two alternatives that move forward for those subsystems, then in October and November when we're looking to prioritize one project versus the other, that's where, you know, 205 has a very high flow associated with it. So in terms of water quality impacts, water quality benefits, that scores a 10.

The 056-039 has a relatively small

discharge associated with it. So comparatively it get a lower score. So if you look at the bottom line, you know, we've got a 6.3 versus a 3.6. So in the overall scheme of things, affordability notwithstanding, apparently solving the big spill at 035 should be a higher priority than the small spill at 056.

So that's just to illustrate the difference between our objectives today and how these criteria apply today versus October. I know we have a couple of questions now.

MR. SCIALABBA: In that first subgroup, under volume captured line, could you just explain that and why that's different within that subset? I don't understand that.

MR. RAICHE: Sure. Again, this speaks a little bit to Ames' point, and what our design criteria are. What we're attempting to do is capture flows and meet our overall discharges. So in the case of 205 here, the first two alternatives and the header may be a little bit misleading on this. The first two alternatives are looking just at flows from 203, 204 and 205.

MR. BLANK: (INAUDIBLE).

MR. RAICHE: Well, yes, it depends. That's true.

MR. DOMENICA: I'm lost.

MR. BISHOP: Right across the top they're showing a lower volume capture for two options versus the other, which I had assumed screening and disinfection you get it all and the other there are some storms actually overflow, but maybe it's a typo on your end. I don't know.

MR. RAICHE: The first column is a typo. The first column should be 201. The second column is 13.4, because in order for the Front Street tank to work, we need some upstream tanks. So there are -- and as a matter of fact in the second half we'll get to those upstream tanks before we get to this point, so, yeah, there's -- it is a little bit more complicated system than that. The idea being for the drop shaft or for the screening and disinfection, we would accommodate 101 through 105 plus 201 through 205. For the Front Street tank, we would need three other upstream tanks. So we're only taking 203 through 205. That's why there's

a difference in the flow.

MR. DOMENICA: So you're saying the first 13.37?

MR. RAICHE: That's a typo.

MR. DOMENICA: That should be 22?

MR. RAICHE: That should be 22.

MR. DOMENICA: Now is 22, does that allow you to close the overflow? If you did a drop shaft.

MR. RAICHE: Well, 22 gets you to four overflows per year, and we'll address that issue in a couple of minutes.

MR. DOMENICA: Even with the treatment facility the screening and disinfection, you're still having four overflows a year that aren't screened and disinfected.

MR. RAICHE: That would exceed the design capacity. The screening and disinfection we're hearing is a very complicated issue, so the design criteria for that would be different from either the tank or the tunnel.

MR. BISHOP: Again, a kind of technical point of order on the presentation, and I assume that this is rectified, but you basically are looking at totals which some are

irrelevant merits without taking into account the capital costs and really the one that matters to meet a cost per gallon captured. And so while I think we can discuss the lower couple which have qualitative issues with administration and social criterion to see if we think maybe you've gotten that right. I don't see how we could come close to saying, well, the tunnel's right or wrong. If we mettle with the social things without having the cost on there it's almost irrelevant to look at those bottom lines. And then you said, well, next time when we come back we've already essentially decided on one and we're just deciding which of the ones we decided on we're going to take. That didn't sound quite like the right streaming to me if I'm without the costs.

MR. BRUECKNER: I think as we go through you'll see that the purpose is to introduce you to what the alternatives are that are being considered, factors that are in important in evaluating them. We understand that cost is very important, and it will be considered. But as we get through, some of these alternatives you'll see we have some

issues associated with them that we'd like to bring out and maybe before we start presenting costs on everything, show you what those are and then present costs, as well.

And the other point we mentioned is that the costs are not quite finished yet, so we'll defer that to the next meeting. But I think that this is a relative discussion because it shows how we're going about evaluating the criteria, which gives you some time until the next meeting.

MR. DOMENICA: Just to your right, Dave, first.

MR. WALKER: You said that the middle alternative, the Front Street tank requires three upstream tanks. So why aren't the volumes of those three upstream tanks being calculated into the volume captured? Because I assume you're going to put the costs in when you do the costs for the upstream tanks, as well, so we know what it really is going to cost.

MR. RAICHE: I simply put this up as an example of the detail that we're going to get into in the second half of the presentation. I wouldn't belabor these examples. I am now

regretting using 205 as my example.

MR. TURIN: Just as a clarification. If I understand what you said even for the drop shaft at 205, you're saying the correct number would be 22.01, but that still includes four overflows?

MR. RAICHE: Correct. And we'll speak to that in a couple of minutes.

MR. TURIN: As we go through this I think this is going to be an important fact for us to understand is to what extent alternatives include full capture and to what extent they're still continuing overflows after limitation. Is there going to be a way for us to tell that? Are there any that include full capture, full separation?

MR. RAICHE: Well, full separation would, yes, that's correct.

MR. TURIN: But ones with drop shafts where you're then putting either into an interceptor or drop shaft into a tunnel, all of those you've are only sized to capture, to max out at the four?

MR. RAICHE: Well, yeah. Here's where we are. There are a number of unknowns at

this point. One of them being the potential changes in rainfall pattern that would influence design. The other being the presumptive approach of allowing four overflows per year and the suitability here, and the final being the water quality impacts that are still being modeled, or will be modeled after we get through this process, and have scenarios to model. What we have decided in the interest of getting through this evaluation within the time frame that we need. As we said before, we have this one-year window to do all this reassessment so that we have the framework for a plan in place by the beginning of next year.

So what we have adopted as an evaluation approach is that we will use the three-month storm which would give us the four overflows per year as a yardstick as a way to evaluate these alternatives with the caveat that we understand that the design criteria for implementation may change, and that when we go to implementation that the size of these facilities may be different. It may include full capture, or somewhere in between four overflows per year and none.

MR. TURIN: Okay, I'm going to have to I guess withhold judgement to how that's going to pan out, but, I mean, one of the things I'll be looking at is the assessment of the cost of elimination as opposed to just the capture of the three-month storm.

MR. LIBERTI: I just have one question. When you first went through the water quality benefits for these two different subareas, you took into account sort of the overall scale, how it fit. So you mention that 205 had a 10 for environmental benefits, because that's a large volume in the overall system. I was wondering if that same approach is carried into social criteria like quality of life? Because if the other subarea, 056-39, if the green infrastructure you're planning serves a very small segment of the overall population or ratepayers, did you also weight that?

MR. RAICHE: Scale that. When we get into the alternatives later this morning, maybe we can modify some of these scores. There was some consideration for the overall area impacted by these, which isn't to say that, you know, we necessarily got it right in terms of

upscale, so I wouldn't want to talk about those.

MR. DOMENICA: Phil -- Tom, go ahead, and then we'll get back.

MR. BRUECKNER: I just want to follow up about what Dave said about the size of the facilities. The reason we're using the three-month storm is it is what we used in Phase I. We needed to start someplace to come up with a cost, so we're using the three-month storm for the design, so we can come up with costs so that we can then use those to determine affordability. So if the three-month storm turns out to be fairly inexpensive to treat and it's below the level of affordability, it would suggest that we could actually increase the size of the facilities to a bigger storm, and still obtain affordability. So it's a starting point to let us know where we are in the grand scheme of things.

MR. DOMENICA: Phil?

MR. HOLMES: We're talking about an average of four overflows a year. We already have a system in place that for the three-month storm we have an average of four overflows a

year. Do these overflows coincide with each

other or it's dependant on the rainfall in Central Falls as opposed to the rainfall in the City of Providence. Because now if that's the case, now we've gone to eight overflows a year, so if your design criteria is not using the same storm as the Phase I storm, then we're talking about chickens and horses, you know. Are we talking about the same chickens, or are we talking about two different things altogether, is the question?

MR. RAICHE: We are using the same criteria as Phase I.

MR. HOLMES: It's likely that the overflows would coincide?

MR. NICK: Within the bounds of what rainfall can do -- absolutely, Phil. Yes, this has been judged on exactly the same standards as everywhere else. I think Tom's point is absolutely correct. And essentially, it is, this is not the -- and I think Dave made the point at the last meeting that was very correct, that the three-month storm is a surrogate because we don't know where to pitch in. So that's what we're using, that's the

25 same. It's consistent across the entire service

1 area. What's been done in the past and what's
2 been done now. And like you said, we're not
3 doing the chickens and horses thing, we're
4 chickens all the way. So you know the point is
5 that we want to be consistent. This has got to
6 be judged by the same standards. When Tim talks
7 about some of the alternatives that we're
8 beginning to roll out, we're identifying the
9 needs of the three-month storm, but where does
10 the possibility to increase that or change that,
11 then we'll also, you know, explain that to you,
12 as well. So that is some degree of what will be
13 captured. Okay.
14 MR. REITSMA: I just would like to
15 make sure that you have been looking at the most
16 recent data on precipitation and frequency and
17 probability and intensity. We had some very
18 recent work done at David Valley at the national
19 weather service in Taunton, together with state
20 climatologist very focus on Rhode Island,
21 itself. Some very surprising trends and the
22 increase in precipitation, but also the capacity
23 of the soils here to absorb stormwater, sort of

beginning to explain why the municipalities have had such a hard time to actually deal with

stormwater. I know that NOAA has just recently released a paper on precipitation trends. And I know that there is a more elaborate study coming next year that you've referenced, I believe, but there's some data available right now, and I think it's substantially different from, you know, what the more traditional projections have been which are, in fact, based on historical data rather than on new projections and new trends, and it could throw off your projections about stormwater flow very, very, very significantly.

MR. RAICHE: I don't disagree with that. In the interest of consistency with Phase I and meeting our one-year deadline for this, we have essentially tabled that additional analysis. Again, that analysis will inform the actual design of the facilities. So in the interest of consistency and expediency, we're using the previous design storm as Nick eloquently said, a surrogate, perhaps a better term than yardstick.

MR. REITSMA: Respectfully, I may

suggest that may not be a prudent approach, because the projections are so different that,

especially in the discussion that we just had. You might find that you need to make adjustments and when we talk about concerns about whether you capture full flow or you have a certain number of overflows occurring every year, I at least am going to share with you what we've looked at in the last few weeks, actually. And I would strongly recommend that you take a look at.

MR. BISHOP: I mean, I think another point in discussing whether more capture in excess of the three-month storm, whether that be more or whether that be full capture. Although screening and disinfection is on there at 22, it's my instinct that that is a more scaleable technology. The storage tech, you just got to make them bigger, you got to have more space, you got to spend more money putting holes in the ground. The screening and disinfection is actually scaleable, and in fact, if it's temporary, even if you have storage you may use it for the kind of events that Jan is

talking about. I just think it's another reason. I think it's grossly premature to set it aside when we're talking long arc.

MR. COLT: I think you started out, Rich, by saying you wanted us focus on the social criteria. And then the factor column has got us up to one. Are you asking us to sort of look at those waiting factors, because the technical evaluation that brought you those 1 to 10 scores of different alternatives is something that we're not really going to be in a position to address at least in these meetings. So are you saying, hey, if operations and maintenance impacts are risks under social criteria should be rated at 6 to 8 percent, you know, what else has got to --

MR. RAICHE: No, we will focus on what the scores are, the 0 to 10 scores in this column here. Based on the homework, I would prefer to say that we've established the weighting. You know Brian's point to, you know, not being able to make a definitive determination until you see the costs, that may well influence monkeying with the weighting, if you want to, you know, influence the the

outcome, but that's just math.

MR. BISHOP: Right. Yeah, I very much understand. I think, I believe it was

Angelo's point already whether those numerical scores, that that really is a qualitative social discussion as to weather the scores and that small area that gets the green infrastructure that's showing a relatively high score and that benefit, whether that's an appropriate relative to the entire rate payer base, and that kind of thing. So I really think we are working on the scores. I do understand that it was the homework that, you know, that accomplished that. The stuff I didn't turn into, I just would have put a hundred percent of my concern on the cost per gallon captured. You know, so when that comes up, that's when I'll be batting in, but I do think we're working on the scores.

MR. RAICHE: Let's just quickly, how quickly do you think you can do it?

Nick, two slides?

MR. RAICHE: There's just a couple of a bit of, a bit of a primer on how these things interact that is important to understand.

MR. ANDERSON: Hello, folks. Again, Nick Anderson from MWH.

MR. DOMENICA: Nick, just a couple of slides, is that what you're talking

about?

MR. ANDERSON: I'm going to do a couple of slides.

MR. DOMENICA: Okay, because we're at break time. We started late, so we'll do yours and then break.

MR. ANDERSON: Yeah, I'll just skip through. I think there's a couple of important points. And the conversation this morning is pay heed to a little about how the system operates currently and how it's going to operate in the future, and I think we need to get that message across. So, I will just skip through to a couple of case lines slides, particularly about green infrastructure, because one of the things that I think's important is that we are paying green infrastructure the right amount. The right amount of -- what's the word I'm looking for. So give it the right amount of interest, really, because it's easily forgotten, and it's all small and it's a bit desperate, we

really do need to just kind of address it as one go.

Now, one of the things that I explained time we had this filtering process

where we took some 600 sites across the entire service area, I looked at the feasibility for green infrastructure. And what we did in sort of a capture is capture eight sample areas is we broke it down into these conceptual designs, and these conceptual designs for green infrastructure have been basically spread out across the area. And what I mean by that is, we took the numbers the capture capabilities for these sample areas and just replicated them everywhere. So not every single location, every bulb out was checked, not every road was checked for its suitability, but we took an average and we reapplied that. So all of the discussions that you'll see after the break relating to green infrastructure, relate back to these conceptual designs. And why is this important? Well, what we also did is we looked at the capability for green to do the entire job. And what you're looking at here is all the outfalls

in the service area are on the Phase III. The size of the dot, essentially, is proportional to the size of the overflow as it currently stands.

Now, the key to note here is the bottom right-hand corner. It's the volume

control. What we're saying by using green is that if we just do the public that Rich alluded to earlier, that we will get a 10 percent reduction the current levels of overflow, which I grant you isn't a wow factor, really, but it does demonstrate the role of green is going to play in all of this. If we take the full GSI which is the public and the private all added together across the entire service area, you're going to get an average of about 34 percent reduction. Again, that's not necessarily going to do the whole job.

Now, one of the key aspects to this was when we looked at the amount of green infrastructure that would be required to reduce those volumes, the ratios between what would have to be constructed to the benefits, and this pays service to you, Brian, in your costs per gallon, the costs will be extremely large in some cases, because we weren't realizing the

benefits of the green alone.

So that is where we kind of have to start raking back or peeling back the layers to try and understand the reasons why. And I just want to put this in your mind before yo go for a

cup of coffee, or it probably needs a coffee afterwards.

But the point is that the hole of the NBC system is predicated on a series of interceptors --- of the discharge treatment plants. In each of these service areas, which are the large designated lines that you can see there, you'll see some smaller, like, grayer areas. Now, they're CSO subcatchments. They basically drain down to the CSOs. Now, I know we've talked about this before, but again, like I said, very important. And then they discharge to the interceptors that carry flows. Now the CSOs sit at the entrance of those interceptors. They manage the flow that go to treatment and manages and goes over overflows to the rivers. Okay. So conceptually, what that looks like is this. You've got your CSO catchment that drains down to a CSO. You've got your interceptor

which takes what we take the underflow and your overflow goes to the receiving waters. Now, under normal circumstances it operates like this. And the arrows are significant to indicative proportions, so you get the flows coming out the catchments, you get the

predominance of that flow going down to the treatment plant, but you do get some of the overflows, and that's what we're dealing with, okay.

What we found, though, is that with the NBC system, and like many, many other systems around the world that I've dealt with, is that what actually happens is that at certain points in the system, it chokes up during wet weather. It can't pass everything down to treatment, otherwise, you'd need a treatment plant, you know, two-thirds of Rhode Island to deal with it. You know, it doesn't work like that. That's where CSOs come in. So what's actually happening, if you notice, that the overflow arrows is larger than it was last time, and this is what we've been finding. So what this means is, and Rich sort of has alluded to this, and this, Jan, sort of pays a little bit

of heed to what you were saying, is that what we're talking about here is that the system operates in a certain fashion. Okay. We're talking about producing all during constructing or designing certainly at this stage solutions to reduce this overflow. So we want that arrow

that's going to the receiving waters down. So we're fundamentally looking at changing at how these systems perform. Okay. So in one sense the rainfall we're using now is no more applicable than any other because what we're going to do is we're going to change how the system operates. Okay.

So the point being that as we go forward with these and the choices that you make today and the things that you're going to see today is what we're looking at really is a steer of what would go into a plan that's going to fundamentally change the system performance. We're not saying that the next time you see this will be a done deal. Costs will be added. And we'll say, there you go, there's your plan, thanks very much. We're off. That's not how it works, okay. But what we are looking for is

some really great conversation like we had about screening and disinfection this morning about what really is going to push your buttons, because when we come back next month with some ideas of how these scenarios are going to play out with some costs, it will be absolutely fundamentally important that we're making the

right choices, because from that, going forward, as we look at rainfall, as we look at real systems, and as we look at, you know, future vulnerabilities associated with CSO performance, those decisions will have a long-term impact.

So don't forget we're in a planning stage. What we're doing now is about a plan to go forward, whether it's green or gray, or whatever, things will change in the future, but flexibility is important as we've discussed. But that's all what we're looking from you today. I said that in about five minutes.

MR. DOMENICA: Quick question. 34 percent reduction to the green infrastructure, given Jan's comment on the frequency duration intensity curves, or any, even the ones that we're using today, given that we're trying to reduce the frequency from four overflows to

less, because if you have an overflow it violates water quality standards, so we're looking, regardless, of how the volume is, you violate water quality standards. So we're talking about four overflows a year for the base plan. Would that 34 percent reduce that below four overflows per year?

MR. RAICHE: No, that's predicated to four overflows per year, Mike.

MR. DOMENICA: So if you don't do the green infrastructure.

MR. RAICHE: There's a subtle difference with -- and if you design the gray to the four, and you use green as a supplement.

MR. ANDERSON: Okay, so let's just go to the final slide. You stole my thunder, Rich. So where's green going to play a role in this, and exactly as Rich said. There's three ways to look at gray. GSI in theory where we sat currently could eliminate overflows at two of the CSOs, okay.

MR. BISHOP: At 34 percent?

MR. ANDERSON: No, they could be eliminated. 34 is the average across the whole

service area, Brian. So just to be clear. This is now drilling it down to individual locations. So we're saying --

MR. BLANK: (INAUDIBLE)

MR. ANDERSON: Yes.

MR. TURIN: Oh, wait a minute, now. Say that again.

MR. ANDERSON: Yes, so this is to

get it down to four overflows?

MR. TURIN: So, it's not eliminating --

MR. ANDERSON: I beg your pardon, yes. Okay. So, sorry, Dave. So, what we're essentially doing is, yeah, managing that down to four. So where we're seeing green fitting in as part of this as it currently stands is in three categories. Okay. So it will reduce the impact of the need for gray. Okay. It will scale it down. It does have a positive impact. It is in some cases necessary as part of that solution in order for us to fit the gray in and I think that's a very important aspect of this. Green will allow gray to be implemented where previously have a null effect.

There is also -- slowing down --

there is also the ability for it to basically form a solution in its own right, as we've seen. But more importantly, in my mind is that a lot of the sites that we're identifying that may not necessarily fit into this plan will be available for future proofing, resilience, not necessarily NBC, but anything that's done in green terms will have a positive impact going forward.

So even if your plan gets you to four, green can be used in the future to reduce that even further, so it does give you an element of flexibility. And the reason I say that is this. If we build something gree that will have a positive impact. But because as I explained on the previous slide, the full interaction of how this system works, you could essentially build green at a higher cost than doing something else, and that's not what we want to propose in the plan. What we want to propose is where green is included, it is in its own right the right solution to do. There's a kind of a mantra that is out there right now that says that it's not just about doing the job right, it's about doing the right job, and we

want to absolutely make sure that is the case. So what we're saying is that just because green doesn't appear everywhere, just because it might not be as large scale as perhaps some folks had hoped for, doesn't mean it doesn't give your future with green. It just means that it might sit outside of this program. So as you're looking at the other alternatives, just bear that in mind, if you would. Thank you.

MR. DOMENICA: Break time. We'll get back in 15 minutes.

(SHORT 15 MINUTE RECESS)

MR. DOMENICA: We got started about 10 minutes late. We had some good browsing discussion there. So as a result if it's okay with NBC, what I'd like to beg is another 10 minutes of your time, so that Phil, if you could come on at noon, do your 10 minutes at that point. I think we have a lot to cover in the next hour or so. I'll give it back to Rich.

MR. RAICHE: So as we get into the second half here, as we said we're looking at subsystem by subsystem. So just a little bit of orientation. As we already said, we're using the three-month storm as our surrogate, so what

we are designing each one of these subsystems to is that volume.

So what are we evaluating? Well, the baseline is still part of our evaluation. Of course, we've got the Pawtucket Tunnel. We've got a couple of interceptors to get Northern overflows to the Pawtucket Tunnel. The Pawtucket Avenue interceptor to get our outfall to 220 over to the tunnel and then a few sewer

separation areas. It does not make any sense to treat these overflows individually. It makes a lot more sense to cluster them into subsystems. And actually, the way the Phase III baseline was developed, actually has some logic to it, and allows us to sort of mirror that same network of subsystems. So we've got our sewer separation area to the West River, another sewer separation area in Providence to the Moshassuck.

Switching up North, we've got the two most Northern outfalls in Central Falls, and then the other two in Southern Central Falls, and then we sort of progress from sort of Northern Pawtucket down through little pieces in the downtown area. The large Eastern Pawtucket,

and then the large Western Pawtucket areas essentially are subsystems.

And as Keith and Tim step through the alternatives, those are the subsystems that we'll be talking about. Now, in terms of alternatives, one thing that we had been talking about all along, an alternative to the Pawtucket Avenue interceptor would be a stub tunnel to connect 220 to the main Pawtucket Tunnel. And in terms of other alternatives, and again, using

those same subsystems to feed flow, as we've said all along, in EPA's position and the technical position is that green rarely is a solution in and of itself. It's typically paired with a gray technology to come up with a sustainable solution. So as we've said, we've got green scattered around throughout. We've got a couple of different ways we're looking at it. One is to reduce flows to a gray alternative to make a gray alternative viable on the land site that we have available to us that previously without the green it would not. And then we've got green to sort of optimize, to sort of balance out the cost and benefits to come to an overall sustainable solution.

So what we're looking at are as alternatives, and Keith will first talk to the sewer separation areas, where we're looking at a hybrid sewer separation and GSI, and then Tim will talk to each one of the tank locations. This is just a table to show where we come up with our design capacities for each one of these components. And what the CSOs are controlled if anyone is super interested in seeing this, this presentation will be posted on the website, and

you can look at that table at your leisure. We had so much information to share with you today that we had to break it into two Power Point presentations for file size limitations. Just an extra bonus.

MR. GARDNER: Keith Gardner, MWH. I'm going to quickly step through the first couple of subsystems, and these are the sewer separation subsystems that were initially identified in the CDRA. Okay. Let's sort of go back to the overall map. The sewer separation areas are located in Northern Providence, the 039-56 is the first one we'll talk about. We took a look at sewer separation, what would that

entail and we also took a look at what GSI could do to reduce the amount of sewer separation in that area, and in conjunction with GSI, we took a look at stormwater flow control.

039-56 also had the West River interceptors Rich mentioned earlier, which would handle both 3956 and may help the Branch Avenue interceptor. So sewer separation in these areas would entail a new storm drain. It's an existing pipe network. The catchments combined are about --

they're about 170 acres, or so. In addition to a new storm drain, what is important to account for here is that it would also entail full surface restoration and utility replacement similar to what was found in the Phase II sewer separation areas. That separated stormwater would then be discharged to the West River with little to no treatment at all. So you'd be adding stormwater, additional bacteria were mentioned earlier, not necessarily improving or removing the water quality impacts.

Also of note in one of the earlier meetings, it was mentioned by one of the Stakeholders that this area is a frequent flood

concern. The West River overflows its banks near these outflows, so it was mentioned additional stormwater into that flood area would be detrimental.

So the hybrid sewer separation area, if you can recall back in April, when we discussed stormwater management, a consistent flow slipping and stormwater storage essentially using gray technology to move stormwater down hills to areas where it's easier capture, reducing the length of the new storm drain. As

we mentioned back in April, this area doesn't really lend itself to stormwater management, so it's pretty much off the table for a couple of reasons, such as the topography really doesn't lend itself to those kind of type of storm and management techniques. The existing curb reveal isn't sufficient to move that flow without impacting the privately properties along its path.

And in the May presentation when we presented GSI opportunities for public GSI in 039 and 056 were identified as being feasible in the areas highlighted in green on the slide

here. So those are in the lower portion of the catchment. It slopes from Southwest to Northeast, and the upper reaches really aren't conducive to GSI for a couple of reasons which are poor slopes -- high slopes and poor soils, and just general lack of opportunity.

So also at that May presentation we provided a couple of conceptual design sketches for these green highlighted areas. They would consist of tree wells, rain garden bumpouts and the public right of way, and some pervious pavement. Those were the kind of green

alternatives that we're taking a look at here. This would reduce sewer separation in those areas, those green technologies would be designed to handle local flows on those streets, on those properties. And as you can see here, they're really on a very small area of the catchment. It doesn't reduce sewer separation all that much.

The third alternative that we took a look at for 039-56 is the West River Interceptor. As Rich mentioned earlier, this is right on the Branch Ave. Interceptor which has other issues than just the CSOs. There's SSO

issues along that interceptor that ideally we'd like to be able to have a solution that handles both 039 and 056 overflows, as well as relieves the Branch Avenue interceptor.

However, we don't have enough information on that Branch Ave. Interceptor to be able to determine right now that this solution would handle those flows in addition to the overflow volumes. So that would require additional study that is beyond this focus.

The West River Interceptor just to recap this would be six feet in diameter about

4,600 linear feet in length and run along the banks of the West River down to near Silver Spring Avenue. This interceptor would be constructed similar to the Phase II Interceptors which was microtunneling or pipe jacking which is generally less disruptive than open cut sewer separation, ripping up every street.

However, the location in the interceptor right along the banks of the West River, crossing the river a couple of times and crossing underneath the highway lends itself to very difficult construction. And impacts to,

there's a middle school on the road, there's a couple of housing developments. So there's still significant impacts along with that alternative.

So getting on to the alternatives evaluation that we discussed earlier. As Rich mentioned, we've gone through the environmental economic and implementation criterion and rated those the three alternatives accordingly. We're still working out the costs, and we'll go through that in October.

What we want to focus on today is the social criteria, and specifically the co

benefits and quality of life, the operation and maintenance and impacts and risks, any construction phase disruptions of these three alternatives. Now, based on feedback from you guys in the previous meetings, feedback from NBC and our own surveys of these areas, we've given it a first cut through these ratings. You guys are a lot more familiar with the area. You live, work, know people in this area. If you have thoughts on these, we'd like to open it up for discussion on where some of these alternatives should lie. If maybe co-benefits

should be higher or lower depending on your thoughts. So, I guess I'd like to open it up this time, and see if anybody has questions or comments.

MR. BISHOP: Yeah, I don't know if you're, especially if that was a discussion, it would probably be incredibly helpful if there were a way -- if this were three-dimensional database where you could give us to understand the fact, you know, to kind of repeat or quantify partly to factors that you put into that number. Because it's a little different, it's a little to imagine how sewer separation

comes up to eight. It may be the green infrastructure because it's a little bit smaller. I can see it's only additional quality of life, but I'm not sure, you know, what gives sewer separation, that if we're factoring in somehow like improvement in your underground utilities that you could sleep better at night.

MR. RAICHE: I can speak to that. So as we said with sewer separation, one of the things that drives up the cost is that we do full depth restoration of the roadways, and

often the roadway restoration includes sort of improvements, better curbs, better sidewalks, things like that. It drives the cost up, but it does give you sort of those co-benefits of quality of life. This was sort of Lance's point, I think, at the April meeting. So that's why it ranks out an eight. With the hybrid, we did have some areas in addition to those sort of concrete improvements to the surface that we're also adding the bumpouts with some greenery.

Again, at this first cut, we give it a high point higher. This is why I want to bring this up for discussion, maybe the eight for the sewer separation is a little high, maybe

eight and a half if you add the green stuff is a little low. And then you contrast that with the West River Interceptor, say. The West River Interceptor is not going to have any neighborhood impact at all, so it gets a neutral score of five, because that just happens along the river. It's away from people. No one's going to see those manholes once you're all done. You're not doing any sort of neighborhood improvements.

MR. BISHOP: So you get five points

for nothing?

MR. RAICHE: Correct, five is neutral.

MR. BISHOP: And I need to internalize that. And maybe that is kind of true in some of the other qualitative things. I do tend to think that that kind of skews the when you put that five in with or add it in with average it in with other numbers, you know, getting five with nothing when you have to have something in your operation and maintenance, I think it tends to kind of overweight that. I'm wondering if that's the right, you know, way to score this. Because I might not have given such

a bump to either of those, but, you know, it's only moderately suspicious that engineers did this and the solutions that are all coming out with the best numbers are the big engineering projects.

MR. RAICHE: I'll try not to take offense to that.

MR. REITSMA: I need you to repeat what you said that was outside the scope -- was that about capacity?

MR. GARDNER: So that was about the Branch Avenue Interceptor. There's a lot of other issues with that interceptor than just solving two outfalls that are part of Phase III. So we can solve the two outfalls here without solving the issues of the Branch Avenue Interceptor.

MR. REITSMA: Okay. I'm not sure I can follow that or to what extent that actually --

MR. BRUECKNER: I can talk about it briefly. So the interceptor, if you built a new one it would have to discharge someplace. The interceptor that's downstream is also surcharged. There's no place to take it, so it

involves doing further work downstream of that. That's what the analysis would entail. What do you do with that flow once you capture it, where are you going to put it because you can't create another overflow, per se.

MR. REITSMA: Would that be work that needed to be done, regardless?

MR. BRUECKNER: Yes, well, that would need to be done if we're going to evaluate the West River Interceptor further or pursue

that. I just want to mention one thing, though. If we get hung up with what numbers should be associated with each of the alternatives, we won't finish. The most important thing to me today is to present to you what the alternatives actually are and talk about them. What I would suggest, and you don't have to do this, maybe if we could hold off on the evaluation talking about the evaluation criteria for each one of these. Go through them all just so you have an understanding of what the alternatives are that we're looking at and the constraints associated with them. This is going to be put on the website. You can go in after this meeting, look at the numbers that have been assigned by

engineers who probably have a different bias than you do as to what the numbers should be, as Brian mentions, and then at the next meeting when we're talking about the alternatives that we'd like to select and why they're selected, you can bring your concerns as to why you would want or not want a particular one to that meeting. We'll also have the cost at that time. And I think it will just help you to at least

get us to an understanding of what we are suggesting for alternatives.

MR. BISHOP: I'm totally in agreement with that, and I don't mean to like, to take this everyone. I want to understand how the system works. And the idea there's a five neutral score is something that, you know, ultimately when we look at these I'm not going to have an issue with, but I'm not going to like everyone that comes up.

MR. GARDNER: Understood. And just to get back to that five score of being neutral. Those co-benefits quality of life rating here is the social long-term impacts of that solution, so the West River Interceptor gets built, it's back underground, everything gets restored.

There's no change to the existing condition for that, the impact area there. Now, the other areas have what we determined were a little bit better long-term solutions because it's got better pavement, you've got better sidewalks. You've got some green infrastructure. So that's getting back to the neutral is where --

MR. BISHOP: I just think neutral is zero, not five.

MR. GARDNER: As you'll see there are other alternatives, and I'm skipping ahead and jumping on some of the things Tim's going to talk about, but if we can go back to satellite and treatment and disinfection, those have aboveground facilities that are long-term uses of that site that are viewed as long-term negative impacts to those sites.

MR. BISHOP: Yeah, and on a relative scale, I'd almost rather use negative numbers because when you add them in, you're still going to come up with a positive score.

MR. GARDNER: Did Rich give you the layout for this, because that's kind of where we started.

MR. BISHOP: I'm with Rich.

MR. HILL: I just wanted to comment. I think it will be helpful too if you quantify some of the things that you show up here. Specifically, I'm looking at the operations and maintenance cost moving forward. Sewer separation. Obviously, the volume captured you have up there is .88, I'm assuming that's in MGD.

MR. RAICHE: MG. That's million gallons for the storm.

MR. HILL: Okay, for the particular storm, right.

MR. RAICHE: So I guess that does wind up being --

MR. HILL: Right, but I guess where I'm headed with that is not all of that would be going to the Narragansett, in the NBC system, you know, if it were truly separated. So how do you quantify those costs? There would be an operational savings, I presume for NBC. Is that a storm cost or an annualized cost, or how did you calculate it?

MR. RAICHE: In terms of cost savings from sewer separation, the cost to run the treatment plants is essentially fixed. And

there isn't, you know, really much variability in what the operational costs are at the treatment plant if you take these storm flows out. So that's essentially negligible. The operation and maintenance cost are more reflective of the actual costs associated with the infrastructure.

MR. HILL: So you're saying if you

take 10 million gallons away from the storm --- it's not going to cost any different, is that what you're saying?

MR. RAICHE: In terms of the operations at the treatment plant, as far as we've been able to evaluate, that could be an interesting evaluation in and of itself to determine what that is, but at first flush, we haven't noticed that it is a measurable cost. So that the operation and maintenance cost here are of the system being created. So for sewer separation, we're putting in new pipes presumably with a hundred-year lifespan and very little operation and maintenance associated with them so it gets scored highly favorably.

The West River Interceptor is similar but is, you know, again, is a trunk

system that may have more maintenance associated with it. Contrast that with the hybrid GSI, now we're into a regime where we've got the vegetated swales as bumpouts, and we've got trees, street trees that need to be maintained. Also, infiltrating catch basins that would require frequent backing. These are all things

that wouldn't be associated with a pure sewer drain system. These are higher maintenance intensity. So, therefore, the hybrid sewer separation cost by comparison gets a lower rating than the pure sewer separation.

MR. HILL: I just want to point one other point out too, and that's capital costs. Some of the systems are well over a hundred years old. So they're going to need to be replaced eventually, sooner rather than later, more than likely. So by capitalizing it completely in this project versus passing it on to somebody else. I'd just ask you to treat that fairly too.

MR. GARDNER: We do take into account in that sewer separation, full sewer separation and hybrid sewer separation, a certain portion of the existing system that

would need to be replaced, not just the addition of the new system, but a portion that would be rehabilitated, and a portion that would be replaced completely.

MR. DOMENICA: I think we might be remiss and not, at least for myself, asking when I look at the social criteria, fishable, shell

fishable, swimmable, of the 3.6 total score, I see .5 related to that. Could you explain what that criteria actually means?

MR. RAICHE: This one is very closely to related to the water quality, and this is more sort of a social characterization of the water quality benefits under environmental criterion. So for this one because we have a very low volume here, it essentially mirrors the water quality benefits. For other alternatives like 205, for example, and 218, where we have very large volumes that we're eliminating or treating, that number is much higher.

MS. DORMODY: I do support Tom's suggestion to give us the full overview of all of these, but if we're going to be doing this as homework for the -- I can imagine what sewer

separation looks like and I can imagine what the interceptor project looks like. The GSI could be any number of things, though, so as we're imagining what the social criteria ratings should be on those, should we imagine the full suite of all green infrastructure.

MR. GARDNER: So in addition to this here, what chose the areas we are presuming GSI. Everything in green is public GIS. And if you go back to one of Nick's slides earlier, he had and I can't do it because of the different -- but we had detailed what is in that conceptual design, the types of public GSI and private GSI we're concerned with. So it's pervious pavement. Parking lane GSI is pervious pavement. It's bumpouts, tree wells, and parking lane GSI is swales, in addition to some of the pervious pavement. And that's what I think. So I think the two of those slides should answer that question.

MS. DORMODY: So we should assume that all of those things are happening in those areas?

MR. RAICHE: In those green areas, yeah.

MR. GARDNER: And the stormwater flow that is generated in those areas, not accepting flow from other areas.

MR. WALKER: I'm a little confused. If you go back to the scoring chart that you've got. You said that doing nothing gets you five

because you're neutral. Yet if I understand what you just said, the fishable, shell fishable and swimmable waters aren't changing because the impact is negligible. So why is that any different than not doing anything in scoring five. It's implying that you're degrading and adversely impacting the condition by choosing any of those for that social criteria, and I don't get it.

MR. RAICHE: I don't disagree with the comment. I think some of the criteria do have a slightly different interpretation for what the scores are. Frankly, the water quality benefits when we get to them, capital costs, you know, I don't think necessarily five is neutral for them, but that is true of its scoring for all of the alternatives. So your composite score comes out to be when you're rating one against the other, and the difference in the

scores is the same.

MR. DOMENICA: Let's take one more, and then we really have to get back to the schedule and let you stream right to the end. Brian, do you have something different?

MR. BISHOP: It's not understanding the matrix that not on this particular location. I think that one of the things that is difficult, I very much understand that your ratings for water quality whether they be under the social banner or under the environmental criteria banner, you are very carefully relating those to essentially the size of the whole problem. It's kink of a cost, it's really a cost benefit rating. And one difficulty that I am kind of having trouble wrapping my mind around is then higher numbers that actually focus on much narrow or geographical benefits in that service area. You know, when we're talking about the difference between a five and an eight, we're not talking about the entire problem, we're talking about the quality of life in that neighborhood, predominately. But when we're talking about the fishable, swimmable, we're talking about its relationship to the

entire problem, and honestly, look, I'd rather have some of the alternative projects look better. In a way I'm hurting my own prejudice of how I'd like this to come out and say I tend to think that this method, you know, is slightly

overvaluing the local impacts.

MR. DOMENICA: I think the other thing, and in violating my own rule here, it seems like what you're saying is say for instance, fishable swimmable .5 is a fair measure between the three options that are on the board only. It doesn't really relate to the overall system.

MR. BISHOP: That's another way of putting it.

MR. DOMENICA: So it's important to what it is horizontal compared to each other, but when you start going vertical, the scales start to change. So I think that's kind of a guideline for going through this table.

MR. GARDNER: Rich, do you have anything else to add? So there's 12 subsystems. We're going to try to skip through them a little bit faster here, moving forward. 035 is another area for sewer separation. CVRA was the

baseline sewer separation, and the alternative for this area that we looked at was stormwater flow control and a little bit of GSI mixed in. Now, 035 we presented back in April and May.

It's 136 acres. It slopes significantly from East to West. Brown University is to the South and the East and the Hope High School is right in this neighborhood.

As many of you are aware and is shown on this, this is right next to these two Phase II sewer separation areas. Outfalls 027, which I believe is complete, and 037 is still ongoing, or near completion. As we've discussed at earlier presentations, significant disruptions to the neighborhood, to traffic to the residents to those two sewer separation projects. So full sewer separation in this area is a little bit different then in 039 and 056. This is a two-pipe system, which means that there is some existing. About two-thirds of the catchment has two pipes in the street. One, theoretically, for sewer, and theoretically for a drain. What we found across, you know, different areas here is that those aren't necessarily dedicated sewers and drains. So

sewer separation we're involving intensive investigation of those sewers to make sure there's no illicit connections to what was believed to be the storm drain. The sewers

connecting to the wrong, houses connecting to the wrong sewer, essentially. So about one-third of the area would require a new storm drain, about two-thirds of the area would require that intensive investigation. The entire area we'd assume a certain portion of the existing sewers would need to be replaced and rehabilitated.

Again, the stormwater at the end of the day if it fully separated would go down to the confluence of Moshassuck and West River Interceptor to little to no treatment.

MR. GADON: I just want to understand the difference between private and public. Hope High School would probably be considered public, Brown University private?

MR. GARDNER: As far as the ownership, yes, that's correct. Okay, so moving on to alternative two. Here we looked at stormwater flow control. Back in the April we presented a concept where flow slipping would

move flow from the east portion or basically top of the hill down at the bottom of the hill. And what that would do is it would remove the need

to go through that intensive investigation on those streets, and would move that overland flow down to the bottom of the hill where it would be picked up and held in a detention type of tank. So there would be a tank at the bottom of the hill that would capture that flow, hold it and release it back into the system after the storm event is complete.

Now, stormwater flow control is not conducive for the upper portion of that top one-third. It's flatter up there and there's less curb reveal. So we would still need to do full sewer separation up in that area which would involve a new storm drain, as well as a collector drain, down through the stormwater flow control area to get it to the interceptor.

Now, we did look at green here. Green in this catchment is really minimal for the same characteristics that make it good for stormwater flow control. With really high slopes, we have a difficult time controlling that flow with green infrastructure. The only

area where it is proposed in this alternative is along North Main Street in the existing median. You can turn that into some type of a swale, or

other capture for local runoff on the street itself to handle a certain portion of it. Again, these are the alternative evaluations we wanted to focus on these social criteria today, but as Tom mentioned, we can try to quickly present that and move on. All right, so 206 is the other area for sewer separation.

This area is just under 14 acres. It's located on the north side of downtown Pawtucket. This area slopes from west to east down to Roosevelt Avenue. There's a couple of churches in the area. The St. Mary's Orthodox Church, christian science church at the bottom of the hill, and there's a YMCA just to the north of it. This system is similar to 039056, and that is an existing single pipe network, so full sewer separation would involve a brand-new drain, as well as well as rehab and replacement of a certain portion of the existing combined sewer network.

The stormwater here would go into the Blackstone River with little to no

treatment. The hybrid sewer separation alternative here in 206 would involve the mix of

stormwater flow control in the middle portion of that catchment, as well as a little bit of GSI up on the top. Now, there is not enough opportunity for GSI to handle that entire upper portion of the catchment. So you would still need to do full sewer separation in that area. So green doesn't have as much bang for your buck in this area for that reason. I guess we'll skip through this, as well. It goes on to the 103 subsystem.

MR. THIES: My name is Tim Thies. I'm with Pare Corporation. We're just up the road in Lincoln, working with MWH on this project. I'm going to present some of the near surface storage alternatives that we looked at, and we looked at these for about a dozen CSO overflow.

The first one to talk about is 101, 103 subsystem. So here we are. We're at the top of the, sort of the top of the watershed. This is the very, as part of the baseline alternative that we looked at as part of the Pawtucket Tunnel that was included in the CVRA.

101 and 103 are at the very end of the Pawtucket Tunnel, actually, just past the end of that

tunnel. So here we are, we're at the very northeast corner of Central Falls.

The baseline that was evaluated as part of the CVRA for these two overflows, was to put in an interceptor and connect that interceptor to the Pawtucket Tunnel. So we're talking about a big pipe to carry overflow volume from those CSOs to the Pawtucket Tunnel. As an alternative to the interceptor, we looked at putting in a combined storage tank near Pierce Park. And this combined tank, this is a near surface storage tank. And I'll talk a little bit about what that means and how that works at this site. But it's common to all of these CSO locations that we evaluated.

As part of this alternative, GSI doing an aggressive GSI, we could reduce the volume of that tank that we're looking at. And we looked at, you know, treatment and screening at this site, but we didn't think it was compatible with this location, and based on the conversations that we had earlier in this meeting, it's even less likely that that would

work here. So the original baseline for this

area was to put in the interceptor we call it the high Cross Street Interceptor. So this would go from essentially 103 down past 104 to 105 where it would discharge into the Pawtucket Tunnel. So the piece of the interceptor that would accommodate 101 and 103 would be the upper, what we're calling the upper high Cross Street Interceptor. So just a piece of that total interceptor. As an alternative, like I said, we looked at doing a storage tank in lieu of that piece of the interceptor. And this is considered a near surface storage tank. It's actually below ground. And the way it would work the overflow would be diverted to this tank during a storm event, where it would be stored. And once the storm subsides, it would be pumped back into the existing collection system where it would be conveyed down to the Bucklin Point Treatment plant for treatment and eventual discharge.

So this figure here in front of you, we looked at for these two overflows, we looked at three options, three different tank sizes. So you can see it underneath that bulk

right there, there's three different rectangles.

The medium size rectangle, the one sort of in the middle, that would be the size tank we would need to capture the entire three-month overflow volume without doing any GSI upstream. We could recognize a small reduction in the tank size if we did GSI in the watershed, and that's that smaller rectangle in the middle. And then the largest rectangle, the one that takes up almost the entire site, we looked to see what we could do on this site if we were to put the biggest tank on there we could, and how much volume could we capture. So sort of the baseline is just over a five million gallon tank. If we did aggressive GSI, we could do maybe a little bit over a three million gallon tank. And if we really wanted to maximize the volume that we could capture on this site, we're looking at maybe a 9 million dollar tank.

MR. RAICHE: Now, this goes slightly towards Dave's point. You know, if we were considering a tank at this location, we have the capacity with this site to handle something larger than the three-month storm. You will see with other locations we do not have

that capacity. That's where your consideration for other design criteria, you can consider that for this site.

MR. THEIS: So some things to consider with this site. Okay, so we're showing the tanks on the ball field. Like I said, these are buried tanks, so these would be beneath that ball field. So while they're beneath it and we could restore that ball field, there's still going to be an aboveground footprint for this facility. There's going be an operations building required with all of these tanks that has pumps in it, has electronics, and it has mechanical equipment in it. Because once the storm subsides, we have to pump this flow back into the collection system. So while we could restore this site to a park, there's always going to be an above-ground footprint, there's always going to be a presence there for this facility.

So why did we pick a park? If we put this beneath a park, this park is going to be at a service for maybe two, maybe even three seasons. Okay. And that's significant for a community like this. When we met with the

community to talk about the potential for these sites, they indicated that there's not a lot of green space in Central Falls, there's not a lot of parks in Central Falls for youth to play sports.

So this one field represents a significant amount of their green space and then the public open space. So why would we site a tank on this property? Well, one of the things that's common to all of these tanks is when we're looking for a location for a tank, we need to consider its proximity to the overflow. You know, it's got to be relatively close to make it work. And there has to be a property available or space available that already doesn't have a building on it. So when we go through all of these tanks, really, what we're looking for are pieces of property that don't have buildings on them that is close to the overflow. That leaves us with primarily public space like parks and parking lots that sort of fit that criteria in most cases, which is why we selected this site.

It doesn't mean that it's an ideal site, and there's going to a lot of impact, a lot of social impact to siting any kind of tank

on this property. But like I said, this was like, you know, a conceptual first pass at this, this was the site that we looked at.

As a potentially second alternative to this, there is a site across the street. Again, it's a ball field. It's public open space. An added constraint for this one is that you see that blue hatch, that actually represents the floodplain. So this site is actually in the floodplain, so that adds a second level, another level of complexity to this site. This site is smaller, so it doesn't give us the option of sort of doing that oversized tank to look at, you know, how much more could we capture if we could. Here we're able to get the base, the 5 million gallon tank, and maybe that 3 million gallon tank on here, but really, nothing bigger. And again this would just like the other site, this would have an aboveground presence once the other site is restored, it would have that operation control building. I'm going to pass right through this. Talk about 104 and 105.

So the baseline for 104 and 105, these are located just south of 101 and 103.

This was to do the lower half, the southern half of that same interceptor that was the baseline and connect it to to the Pawtucket Tunnel.

So as an alternative to that, the lower high Cross Street Interceptor, we're talking about doing a combined tank on the former Webbing Mills property. Now, some things to consider about that alternative, we could possibly reduce the size of the tank with some GSI. We don't think treatment and screening and disinfection is compatible with this site.

It may be most importantly to eliminate that baseline alternative, that lower high and Cross Street Interceptor. You would have to do something like a tank at 101 or 103. You couldn't have the Upper part of the interceptor, and not the lower part of the interceptor. So you have to do something at 101 and 103. So again, here's a site where we're in close proximity to the overflow. There's space available. It's a parking lot. But this is a private business. And again, this tank, to build this tank we're talking about, maybe two to three years, construction seasons to get this thing constructed. That's going to have a

significant acute impact on the business right there. That's Storage America. It's a self-storage facility. There's some other operations there. That's going to have a very significant impact on that one business, a very acute impact. And that's something that would be considered if we were to move past this early conceptual design.

201 and 202: So the baseline for this is as evaluated in the CDRA was to divert this flow to Middle Street Interceptor and to the Pawtucket Tunnel via a drop shaft near 205. As an alternative, we looked in putting in a storage tank on East Street or at the end of East Street. Again, with the tank we thought we might be able to optimize the tank, and by that, I mean reduce the size if we did aggressive GSI in the watershed. And like the others we don't think screening disinfection is going to be a compatible with this particular site.

So this site has some challenges. It's also a parking lot for a business. That's one challenge. This one is also technically more challenging because the property that's available for this is actually at a higher

elevation than the overflow. So to get the flow to this property is going to be technically challenging.

For the 203, 204 and 205 overflows, the baseline again was to do the Middle Street Interceptor and connect it to the Pawtucket Tunnel via a drop shaft at 205. As an alternative, we looked at a combined tank and aggressive GSI. We looked at a tank on Front Street, but to get that tank to work, we have to do some kind of aggressive GSI just because there's not space available for the volume, and I'll show you that in a second.

Again, to make this work similar to the 101, 103 scenario, in order to get this to work, we would have to do the tanks at Pierce Park, Webbing Mill and East Street. Just to get this to work, we have to do those other tanks. So the Front Street property where we're looking at siting this particular tank, it's a long, narrow parcel right next to the Blackstone River. There's quite a bit of space there. This tank that we're looking at, though, is over 600 feet long.

This is just a giant tank, and this

doesn't even accommodate the entire volume. This is about a 10 million gallon tank, and we're going to need something in the range of 13 to 21, depending on what's done upstream. So this is a site where we initially we thought maybe some screening and disinfection would work here. And based on our conversations earlier today, that might not be an available option for this site.

I don't know how much discussion we want to have on screening and disinfection, so I'm going to pass right by these. So for overflows 207 to 211, here we're sort of in the middle of the watershed, sort of about halfway down the proposed Pawtucket Tunnel.

MR. RAICHE: Just north of Slater Mills Dam.

MR. THEIS: That's right, just north of Slater Mills. So the baseline for these overflows was to do a drop shaft at 211/210 and divert the flow directly to that drop shaft right into the Pawtucket Tunnel. An alternative to this would be to do a combined tank near city hall. This is a watershed where

25 we don't think GSI has a tremendous amount of

1 potential to reduce the volume of the tank just
2 because of the soil constraints in the area.
3 And we also don't think that treatment and
4 disinfection is a viable at this site.
5 The conceptual tank that we're
6 looking at for these overflows, this is right
7 across the street from city hall. It's in
8 between city hall and the police station. We're
9 actually showing the tank beneath the police
10 station parking lot. And to get the volume that
11 we need, the tank is really significant in size.
12 It's over 7 million gallons, and it takes up the
13 entire parking lot for this facility. So the
14 impact to the facility and city hall during
15 construction is going to be very, very, very
16 significant.
17 We also are forced to sort of a
18 irregular shaped tank for this one because of
19 the site constraints and because of the volume
20 we need. There's going to be a lot of technical
21 challenges with a tank, sort of with this
22 irregular shape in terms of future maintenance
23 cleaning. There's going to be issues with this
24 kind of tank.

203, 214: The baseline for this

was to do a drop shaft at 213 and divert that overflow directly to that drop shaft to the tunnel.

As an alternative, we looked at doing a tank, again. GSI, we thought might be able to optimize the tank. We might be able to reduce the volume, and again, we don't think treatment is an option at this particular site.

Here's another one where the space available. There's really nothing available near the overflow. We actually are bringing this flow from 213 and 214, all the way down Taft Street to essentially the first open parcel available, which is a city park. For a lot of the same reasons that we're concerned about 101 and 103, about open space, about taking up open space and the construction disturbances, we have those same concerns about putting a tank on a public park like this. So for 217 the baseline was to do a drop shaft right at 217, and this would also receive flow from 220, via the Pawtucket Interceptor. So as an alternative, we looked at putting a tank on the tide water site

in Pawtucket.

Some GSI could reduce this tank

size, and we initially thought that maybe treatment and disinfection would be compatible with this site, but now we'll go back and we'll rethink that. If we were to eliminate that baseline option, we would have to figure out something to do with the flow from 220.

Now this one a little bit unique in that the space that we're looking at is not a public park, and it's not a parking lot. It's an industrial site that doesn't have buildings on it anymore. This one we thought that an aboveground tank may actually be better suited for this site because of its former industrial use. We're concerned about running potential contamination issues out there, digging a significant tank is going to be very challenging, very costly. So here we thought that an aboveground tank may actually be better suited for the site. And the way that would work for the aboveground tank is instead of pumping out of the tank when the storm subsides, we would actually pump into the tank, and then let it go out by gravity. Pumping in requires

much bigger aboveground infrastructure because we have to patch the peak flow coming into the

facility. So it has a much bigger pumps bigger mechanical equipment, more electrical infrastructure which actually drives up the siting, the overall size of this particular alternative.

Now, something to point out while this is an industrial site right now and there's nothing on it. The City of Pawtucket has recently come out with an RFP to do a master plan for this site do it jointly with National Grid, because this is a National Grid property, and look at, you know, what is the highest and best use of this property in the future. So any consideration of putting any infrastructure on this site would have to consider that master plan, and conversely that master plan we'll probably need to consider what this program is going to do and how it might impact this site.

107, 220: So here we're talking about the western side of Pawtucket and part of Central Falls. So the baseline was to do an interceptor from 220 and bring it over to a drop shaft by

217 and drop it into the Pawtucket Tunnel. As an alternative we looked at doing a big tank on Morley Field which is a ball field near 220.

We also looked at screening and disinfection for this one. And as a second alternative or third alternative, we looked at doing a stub tunnel directly from 220, essentially right to end of the Pawtucket Tunnel. So just south of the overflow, south of 220 is Morley Field which is a public ball field. You can see this is a place where we were able to do maybe three tanks or looked at three different tank sizes.

The smallest one being if we did aggressive GSI in the watershed, the sort of medium size tanks would be the minimum we would need if we did no GSI just to accommodate that three-month storm. And then that larger tank is what could we do if we wanted to really maximize the volume that we could receive, that would be that maximum tank right there, and that's just under 10 million gallon tank. Same concerns about putting on a ball field that we had with 101 and 103, although we understand that this ball field maybe isn't used as much as those

other ball fields, but it is still something to consider. These tanks are really large in size in they're going to take up quite a bit of space

at that facility, and again, they're going to have this aboveground facility building, this aboveground essentially pump building, which is going to result in a permanent footprint on this site for these structures.

So 212, 215, 216 and 218, the baseline that was evaluated as part of the CDRA was to do a drop shaft at 218 and divert the flow directly to that drop shaft and drop it into the Pawtucket Tunnel. So we looked out of a combined tank near the Bucklin Point to capture that flow.

This is one where we looked at screening and disinfection, as well, but again, we may revisit that, as well. And we also looked at doing a stub tunnel or combined this with a stub tunnel from 220. So the site for a potential tank for this one, there is a landfill, former landfill just south of Nassau Street. It's an old sludge landfill, so we think it would be available for this piece of

infrastructure. It's one of the few sites that's not either a parking lot or a public park right now. We thought as an alternative to doing a buried tank because it is on a former

landfill, an alternative would be to do some aboveground tanks. This is probably the biggest volume that we would have to address with storage. This is almost 15 million gallons of storage we would be required to have on the site to address that three-month storm line. So these are really significant. Those three circles represent three 5 million gallon aboveground tanks which are very sizeable.

So, like I said, this is one site where we thought maybe doing above ground versus below ground might be something to consider if we move past this conceptual phase.

MR. BREUCKNER: I just want to point out on that site that's land owned by NBC now.

MR. THIES: Oh, okay. I'll turn it back over to Rich.

MR. RAICHE: We did skip through some of the details on that and in the interest of introducing all of those, you know, perhaps

we can have some discussion around those alternatives and reactions to the tanks and the impacts on the neighborhoods that they present.

MR. HILL: The tank options are

going to be pretty rough for the communities to have to deal with. You know, not only the business owners which everyone's going to struggle with that, but the field conditions, we're in a very, very dense area. The shutdown of the field for several years is going to be a challenge. I'm not sure we can support that, to be honest. The other problem with the tank so that they probably work great when they're completely bone dry, but if you have back-to-back storm events, they're going to rendered useless anyway. So I would ask you guys to take that into consideration. And lastly, I know that sewer separation has been excluded from your study in Pawtucket, but I still maintain that there has got to be -- we're talking hundreds and millions of gallons that the treatment that would be diverted from the system. I would imagine that there is cost returned to the ratepayers or support additional

capital construction cost too which is asked for it several times. I really would -- I would like to see some type of breakdown on what those savings might be? Thank you.

MR. DOMENICA: Generally, just to

comment on that. If you look at -- annually the total flow to a wastewater plant, say Field's Point, and you look at what percentage of that is actually wet weather flow that comes in, while the wet weather flows are large peaks, the relative volume over the year which is generally what O and M cost is based on, generally Dave and others may have some numbers here runs around somewhere between 3 and 5 percent. So relatively, that's what you're looking at. Now, that doesn't convert necessarily O and M savings, it could a little higher or a little lower, but that's relatively where it is.

MR. BRUECKNER: I think, Mike, for us, is about 10 percent.

MR. DOMENICA: It is you capture more. With the tunnel, yeah -- Harold?

MR. GADON: This is for Tom. Does NBC presently use any tanks?

MR. BRUECKNER: No, we don't have

any near surface storage tanks or underground tanks.

MR. GADON: And what would be the construction of those tanks, what material?

MR. BRUECKNER: They'd be concrete.

MR. GADON: Thank you.

MR. HILL: Although existing operational costs may only be 10 percent, if you're talking about building a tunnel that you're going to capture, although and eventually treat it anyway, you are going to have that increase.

MR. DOMENICA: Yes, that's right. And 10 percent is significant, too. Anything else that's important?

MR. MANCINI: I just had a question. The actual baseline of Phase III with the tunnel, does that include portions of sewer separation, or is sewer separation an alternative?

MR. THIES: That included sewer separation and a couple of sewer sheds, like 039-056. The baseline included sewer separation in those. So those are sort of out large,

they're far away from the Pawtucket Tunnel. So to get that flow to the Pawtucket Tunnel is deemed infeasible, so they looked at doing sewer separations and a couple of sewer sheds.

MR. MANCINI: So it was like Phase II?

MR. THIES: Correct. Similar to what was done as in some of the sewer sheds for Phase II.

MR. MANCINI: Thank you.

MR. DOMENICA: Given that and where we are time wise, thank you to MWH and Pare for taking us through that. That's a good baseline for the next meeting. Tom?

MR. BREUCKNER: There's one more slide, I think. So the next meeting.

MR. DOMENICA: Oh, good. We can do that now. The next meeting is the 23rd, and then Phil wants to have the floor.

MR. BREUCKNER: I just want to mention it's going to be the integrated planning framework, which will include the alternatives analysis, the cost for the alternatives talked about today, and also the affordability discussion based on cost for not only this, but

stormwater and the local sewer maintenance costs.

MR. DOMENICA: Thank you all, and Phil, you have the floor.

MR. HOLMES: My name is Phil Holmes I represent the Rhode Island Shell Fisherman

Men's Association. I don't know about the rest of you, but I'm a little depressed about the future of the waters in Rhode Island having seen all of this and the affordability of these systems as opposed to the single pipe system. It's all scary stuff. But I'm going to say what's on my mind. Shell Fisherman are not looking to get up into the Blackstone River. Nobody is ever going to shellfishing in the West River. Nobody is ever going to go swimming or fishing in the West River, because everybody knows it's not the place to go shellfishing, fishing or swimming. That's a given.

What the shell fisherman are concerned about are the beds in the lower bay. The Rhode Island Shell Fisherman's Association is extraordinarily pleased with the work that has taken place in Phase I. We're looking

forward to the expansion of Phase I with the inclusion of Phase II, and what will the effect of those two systems have on Narragansett shellfish beds. Prior to 1950, the closure -- see, we're owned and operated by the Federal Shellfish Sanitation Commission and the Interstate Sanitation Commission, and they look

at time of travel for bacteria in saltwater generally they last less than 24 hours. They also concern themselves with dilution so time and distance becomes important. So they set a line, they drew a line and they said this far no further based on the location of the Field's Point Treatment Plant. We can go so far, and we're never going to get more north of that line. That line was Gaspee Point to Sabin Point prior to the 1950s. When the city grew and pollution became worse, they moved the line south of the Conimicut Point/Nayatt Point line. That's 35 acres of prime shellfishing beds that are on average 15 feet deep, which means we can reach them. There's a lot of areas in Narragansett Bay where the water is pristine like under the Newport Bridge, but it's 210 feet deep, so nobody is going shellfishing there.

So we look at shallow waters and say we want in, we want to get in there. And one of the things that I'm looking at is volume, because volume matters, volume matters in dilution. I look at 220, 205, 218 and the north diversion structure at 002, and I say, can we reduce those volumes in any way, shape, or form

so that the overall volume going down the river is reduced. If we delay with a tank, the bacteria already starting to die, so we get what we need, we get time for the bacteria to die and we get dilution by volume because the river gets wider. If you look at 220, I mean, it's the only thing going into the river at that point. You know, you've got a 20 million overflow into a pencil thin line with no water in it. I mean, it's got to be like this big slug of polluted water just going down the river. What can we do about reducing the flows of 220, 205 is another one, and 218 is another one? 80 percent -- 65 to 75 percent of the pollution in that system, in that entire system appears to be coming out of those three overflows.

The treatment plant was recently

upgraded, do we need to upgrade it a little more so we can create a greater volume of treatment? I mean, that's a question that I think is important. Some of this question is directed at Dave Turin from the EPA. I know you're restricted by the law that you enforce.

Is it possible that we can break the Phase III system that we're looking at, this

great big -- can we break this into Phase III and Phase IV, so that we take care of the worst offenders first, and then we begin looking into green infrastructure. We're supposed to, you know, we were looking when we had the first Stakeholders meeting, we were expecting new technologies at some point in the future to help us with this problem. Is green infrastructure one of those new technologies, or do we need to look further ahead and say, well, what's coming next for this problem? This is a real problem, and nobody wants to go swimming in polluted water, but the bacterial numbers for safe swimming are 50 parts per million of pollution in the water. Okay. Shellfishing, it's 15 parts per million.

If you took a Striped Bass out of

the river right at the outfall at the Bucklin Point Treatment Plant, you could filet it, cook it, and eat it without getting sick, because you're only eating the muscle, and you're cooking it. Okay.

If you took an oyster, which nobody in their right mind would do, from the same place,

95 percent of the oysters taken are eaten live, shuck them and eat them. Come to the seafood festival at Bucklin Point -- no, no, no, what's -- in Newport, the weekend after Columbus Day, and I'll open an oyster for you, and I mean they're delicious. Nobody wants to cook an oyster. Who wants to do that. But you're eating the oyster live and whatever's in it, you're also eating live. So if there's bacteria in it, you're eating th live bacteria, and you're going to get sick. So clean water matters more than anything to the shell fisherman, but access is also important. So if what we do gives us access into new grounds, the industry is going to grow, incomes are going to grow, individuals who rely on shellfishing for a

living, and there's a lot of them, there used to be more, but it's important to us to have access to clean water. And that's the bottom line for us, is we need clean water.

We're never going to get further north than the ISSC says we can go, so I'm looking at it and I'm saying, what's the point of spending all this money? Because to me, I see tremendous expenditures, and this is from my

point of view. And I love Narragansett Bay. I've earned all of my livelihood from Narragansett Bay for the past 40 years, so I love NB, and I want to see it cleaned up. But there's more to this problem than, you know, CSO 220 and CSO 205, and the rest of these things. There's a lot of pollution coming out of Massachusetts that are causing Rhode Island serious problems. I started this journey 25 years ago in Room 35 up at the State House, and I was testifying before Senator Jack Reed, who was a state senator at the time, and a senator from Massachusetts, his name was Norton, and it was a bay state ocean state initiative. I think one of the things that should come out of all of this is we need to begin talking to

Massachusetts again. I mean, it started back then, and I don't know what ever happened to it, you know.

Hundred Acre Cove in Barrington is closed to shellfishing because of pollution coming out of Massachusetts. The Palmer River in Warren is closed to shellfishing because of pollution coming out of Massachusetts. The Kickemuit River, which for 350 years since the

founding of the nation never closed because of shellfishing, because of pollution coming out of Massachusetts.

We have other problems within the state. The first meeting we had here, when I saw the plume on Phase III, when I saw the plume of pollution coming out of the Pawtuxet River, and how it raised the fecal coliform numbers in that section of the Upper bay, I mean, the Narragansett Bay Commission is spending this money, doing this work, gaining results, and we have waste problems in our own yard. The treatment plants on the Pawtuxet River that are in Warwick, West Warwick, and Cranston, somebody needs to talk to -- Dave, somebody needs to talk

to them about getting their house in order. It's a problem. When you look through this, there's newspaper accounts about septic systems and failed cesspools that need to be addressed. You'll find one page, there's three stories that were in the Providence Journal about the bill that was in the State House about cesspools. The first one's this nice big thing about how this bill was reintroduced, and below that there's another story and below that there's

this little tiny thing that said the bill died. It's a half an inch of a column. You know, the Providence Journal's not doing their job, either. So there's much to be done. I thank the Narragansett Bay Commission for all the work that you've done. Ray, thank you. I really mean it. I just want to see a cleaner bay, and I know it's going to take time because I've already been at this for 25 years. I'm getting tired, but I'm not giving up. You guys are not going to be able to shake me loose. I'm coming to the meeting and the meeting after that because I owe Narragansett Bay my life and my livelihood.

MR. DOMENICA: Thank you, Phil.

The next meeting is again the 23rd, and thank you for your attention today, and we'll see you then.

(HEARING CONCLUDED AT 1:10 P.M.)

C-E-R-T-I-F-I-C-A-T-E

I, PAULA J. CAMPAGNA, CSR, a Notary Public, do hereby certify that the foregoing is a true, accurate, and complete transcript of my notes taken at the above-entitled hearing.

IN WITNESS WHEREOF, I hereunto set my hand this 17th day of October, 2014.

_____

PAULA J. CAMPAGNA, CSR, NOTARY PUBLIC/CERTIFIED COURT REPORTER

MY COMMISSION EXPIRES: April 25, 2018

IN RE: CSO PHASE III STAKEHOLDERS MEETING

DATE: September 4, 2014