Verbatim Notes of the Public Presentation

ENVIRONMENTAL IMPACT ASSESSMENT

SOUTHEAST REGIONAL MEDICAL (INFECTIOUS) WASTE TREATMENT FACILITY

Presented at: The Jamaica Conference Centre
Duke Street Kingston

Presented by: C.L. Environmental Co. Ltd.

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CL ENVIRONMENTAL
Taking Care of You and Your Environment.

where you left for, you are at the public presentation of the Environmental Impact Assessment of the proposed South East Regional Medical Infectious Waste Treatment Facility. The agenda you have in front of you starts with a welcome and introduction. I am going to vary that just a bit and do Item 2, the prayer, and I understand Mr. Coombs you are going to do the prayer. Would you kindly take us in prayer. Thank you very much.

(PRAYER SAID)

CHAIRMAN: Well, it is my job to welcome you all here, even though small in number. To this presentation, to make some introductions and to perform the task of ensuring the questions and answers go through quite smoothly this afternoon. I would just want to indicate that the our Environmental watch dog, the National

Environment & Planning Agency has set up certain legislations, certain rules and regulations in planning for projects which requires in some instances Environmental Impact Assessments to be done, and this public presentation here is one of the requirements, and it is a natural requirement. Such a requirement comes out of this new paradigm of our participatory democracy, and requires that every Environmental Impact Assessment must be presented in a public forum such as this. Of course some of you will have already met the consultant, who is also required as part his duties to have public consultations during the period of this studies. So this really is therefore the formal conclusion to his findings and gives you the opportunity as the public to hear these conclusions, to listen to the impacts and the proposals for mitigating such impacts and bring forth your comments

and recommendations by way of questions.

CHAIRMAN: With every public right, of course, which is bestowed to citizens comes a obligation, and the obligations here I am asking are that you listen well, try to understand and ensure that questions are posed fairly and clearly to the consultant. Adequate time will be allowed for questions and answers and it must be borne in mind that as part of the requirements of the agency there is a period of 30 days within which you can pose written questions concerning what you have heard here this evening. Without much ado I would like to introduce you to Mr. Campbell from CL Environmental Company, who will take you through this Environmental Impact Assessment and field your questions at the end.

Mr. Campbell is an environmental

scientist with over 12 years experience in Environmental Impact Assessment both in marine and terrestrial environments and environmental audits in both bauxite, sugar and chemical industries,

Additionally he has conducted numerous noise and indoor air quality assessments as well as water quality assessments. He is a trained geographer and a marine geologist and he is owner, managing director of CL Environmental Company Limited, an environmental consultancy firm. His curriculum vite is long. I will skip perhaps his education and training, enough to mention that he has a Masters of Philosophy in Marine Water Quality at the University of West Indies. I think that's enough qualification for you to judge his pedigree.

His notable jobs include Environmental

Impact Assessment for the proposed Mainland Cement Grinding Plant in March Pen Road, Spanish Town. Environmental Impact Assessment of the proposed 49.5-megawatt power barge in Old Harbour Bay, St. Catherine. Environmental Impact Assessment of the proposed Yallahs Bridge reconstruction in Yallahs, St. Thomas for the National Works Agency. The Environmental Impact Assessment of the proposed western Spanish Town Waste Water Treatment Plant, and also for the proposed luxury villas at White Bay, Trelawny, for White Bay. The development of a National Programme of Action for land based sources and activities that impact on the marine environment, done for NEPA, and the Caribbean Regional Environmental Programme Amenities Assessment Project in Trinidad and Tobago, and noise surveys carried out

for Jamaica Energy Partners and occupational health and safety assessments carried out for National Housing Trust. Mr. Campbell therefore comes with a wealth of knowledge and as a consultant and a professional also will come without bias to this project and will bring his scientific findings squarely, and his impacts I am sure will be fully presented and the mitigation measures equally thoroughly presented. Thank you very much and I wish to welcome Mr. Campbell.

MR. CAMPBELL: Thanks. Good afternoon, ladies and gentlemen. As was said we are presenting the findings of the EIA. We are going through the rationale, also the description of the proposed project, policy and legal framework that surrounds this type of project, the baseline description of the environment, the

existing environment; analysis of alternatives to this project, impact and mitigation and the Environmental Monitoring Plan surrounding this project.

The rationale, the current situation: Eighty-three percent of the total medical waste is generated by the public sector, the other 17 percent is generated by the private sector.

Presently there are no environmentally sound waste treatment facility both in the public and private health care facilities. Most health care facilities use on site incinerators. Most of them we call burn boxes because they are not up to scratch in terms of their performance, in terms of the air quality and other parameters. Also, 26 of 29 medical waste incinerators in the public sectors are over 20 years. They

are inappropriate in design and most of them are malfunctioning. They are not in compliance with the new NEPA air regulations that were propagated and on numerous occasions the waste is either burnt or dumped illegally. That is seen by media reports from communities having problems with incinerators giving off soot and other things. Against this background the Government of Jamaica decided to invest in the appropriate technology to deal with this problem that they are having. And, of course, with all this negative

things happening it places a burden on the public purse in terms of people wanting recompense and stuff like that.

MR. CAMPBELL: The global trends in medical waste management follows: There is a decline in the use of incinerators due to the stringent regulatory requirements. There is a tendency to use alternative non-incinerating technology as we are proposing here. Most hospitals are shutting down their on-site incinerators. There is a trend towards regionalisation and centralization of medical waste treatment. Both that and the non-incinerator technology is the way this project hopes to head. These are some examples of what currently occurs. Pictures tell a thousand words. Some of our incinerators you can see black spots around, proving that they are burning inefficiently. The plans for improvement

include a National Medical Waste Management Policy with regulations and standards and guidelines to guide the whole medical waste treatment thing for Jamaica.

MR. CAMPBELL: There will be four regional medical waste treatment facilities, that's what is proposed. All of them with the alternative non-incineration technology. There will be regional collection and transportation systems put in place. There is a hope to standardize waste management procedures in all health care facilities, so that all of them does the right thing, do it the same way. That helps in the whole management process and at each health care facility there is plans to get waste segregation and minimization strategies up to par. To do this they have to train the health care staff in the proper way of waste

management, in terms of segregating what waste goes where and how we can reduce the amount of waste that they generate.

Where we want to put this project is situated in the existing parking lot of the KPH and Victoria Jubilee Hospital. That area is used for storage now for domestic waste from both hospitals, and also as additional parking for staff and also visitors. The area that is required for this development is approximately 2,500 square meters, and here we just telling you the boundary. It runs along Drummond Street, the western boundary is along Princess Street, southern boundary will fall from a perimeter actually parallel to North Street, and the eastern boundary will run along Luke Lane. The plans are that once the project is put in then they will expand

southwards towards North Street, so that we can provide for additional parking that will be lost because of this project being put in the existing parking lot.

This aerial gives an idea of where the site is. That is the aerial located in that red square. To the west you will see Victoria Jubilee Hospital and KPH, and the arrow shows you exactly where we intend to put the project.

MR. CAMPBELL: This health medical waste treatment facility is being put in place to deal with medical waste from the southeast health region. That includes the parishes of St. Catherine, St. Thomas, Kingston and St. Andrew, and the number of facilities that we hope to include in this medical waste treatment facility is nine hospitals, 30 health centres, most of them

Type 3, 4 and 5, because those are the ones that we expect to generate the medical waste or the infectious waste that we need to treat, and of course the National Public Health Lab and the Blood Bank. We estimate that those facilities generate about 490 tons of medical waste per year and the proposed treatment facility that we are putting in place would adequately deal with that 490 tons, and this facility operates five days a week.

MR. CAMPBELL: This map gives an idea of where the hospitals are. One in St. Thomas, two in St. Catherine and rest in Kingston and St. Andrew, and this maps shows you the health centres a little bit more in St. Catherine and the same one health centre in St. Thomas. Now, the process in which this medical waste facility will operate, first the first picture at the top left where it have segregation of the

health care facility, whether it be the hospital or the health clinic. Then it will have an interim storage, put them in containers and then we have an interim storage, then a truck that we will talk about later on will come pick it up, carry it to the medical waste processing facility for treatment and processing and at the end of that then it will be carried to the municipal landfill, which in this case is Riverton Landfill. Most of this will deal with basically waste minimization and segregation. That's how we intend to get this as an efficient system. So from the source we are going to deal with the whole thing of waste minimization and in terms of putting all the waste in the appropriate bags, as you know, and then when it comes to the facility to deal with how best to deal with them. We also have to ensure that the staff at these facilities, both the

hospitals, the health centres and also the medical waste facility are properly trained to deal with waste, and in terms of how best to segregate the waste.

Also we have to look at the occupational health and safety requirements for the workers. That is critical because the waste that we dealing with, a lot of them infectious, there being probably AIDS stuff like that. Of course, as I was said, they are sorting them then they will put it in colour coded bags, and there is an international way of dealing with waste. We are dealing mostly with the ones in the red bags and all of them will be visibly identified with international labels, and the next slide will give an idea.

MR. CAMPBELL: The treatment facility will deal with cultures and stocks of infectious agents. It will deal with sharps such as needles, syringes, scalpels and blades, pathological waste, including tissues and organs and body parts, human blood waste and blood products, isolation and surgery waste, bandages, stuff like that, sutures, laboratory waste, and note that we not going to deal with chemical waste. This type of technology doesn't deal with chemical waste properly so hence the segregation is very important, both in terms of chemical waste and radioactive waste. Soft waste, gauze, bandages, et cetera, and discarded materials, contaminated blood, body fluids and other things. Also it can deal with animal waste from like the veterinary sector.

CHAIRMAN: At the health care facility the infectious waste will be segregated and put in red plastic bags or in sharps as the case

maybe, with needles. These bags will then be placed in some plastic bins. You will see a picture of that, which are lockable, and then they will be placed in the interim storage area at the health care facility until transportation comes to pick up.

The collection frequency will depend on the generation waste of the facility. In the EIA we did some preliminary calculations and we got the rates at which we expect these facilities will generate the waste. The greatest extent we saw was probably twice a day at one facility, but generally it's once or twice per day to three times per week for hospitals, and weekly for health centres. This is an example of the red bin that we expect to put the red bags in. It's a plastic, has wheels so it can be wheeled along, and

some examples of the type of size that you will see by hazards and infectious waste sites.

The vehicle that will be used are trucks that have enclosed bodies. They will also have the U.N. signs and identification number, and the body compartment will have the following characteristic: It will be fully enclosed and lockable so that persons who we don't need to get involved or to get close to that type of waste, then we can prevent that. It will be constructed of aluminium and it will be sized so that it can transport up to 12 bins at anyone time. The inside will be free of sharp angles so things won't get caught up and will be easy to wash out in case of any spills inside. In the bags there will be facilities for it to be secured so that it won't

turnover while transportation out to the hinterlands. And of course for it to be lockable we will have shutters and also we will have a tail lifts on it so as to help the operators to load and unload the heavy red bins. And this is a picture giving an example of one of those types of trucks. Below you can see type of sign we are talking about will be on both sides of the body of the truck. We hope to licence these vehicles or register them with the national sold waste management authority and also NEPA. A manifest system will be put in place so that we can track the waste from the source or from the cradle to the grave as they say, and a copy will be issued to each person along the way. The health clinic, the health facility, the transporter, the medical waste facility and also at the dump, to ensure that it

goes to Riverton. At the facility the red bins will be off loaded using that tailgate that we are talking about, and then retired inside the building. There it will be manifested. We will check for radioactivity to make sure no radioactive waste gets in there, and it will also be weighed. Then the system is mechanically in terms of it will load the bins mechanically. So once the operator puts it there then from there it goes about mechanically. At the end when the bins are emptied they will be sanitised using a mechanical washing machine and then it will be disinfected and stored in a designated area until they are picked up to carry it back to the health care facility. The collection vehicles will also be sanitised using pressure and hot water, pressurized water.

This is a schematic of what we expect the facility to look like. The north arrow is in the wrong direction we actually need to turn it anticlockwise. Drummond Street should be at the top. Basically that's what we expect. We going to have a back up generator to help in terms of power outages. We will have a cold storage that will keep

things for at least three days. We going to have the truck washing clog forms for the trucks for maintenance, and also for the area to wash the bins. Parking will also be there.

The technology that we intend to use is called a T-2000 Ecodas steam sterilizing and shredding technology, and that comes out of France. This process reduces the waste to about 80 percent, so we are losing some volume there, and that's good for the landfill. It does microbial inactivation 8 Log 10. Basically the standard is around 6 Log 10, so it more than exceeds the standard in terms of dealing with microbes. This system is approved by regulatory agencies in the U.S., France, Asia and other areas that it has been installed. This picture here gives an idea of what it looks

like. A big steel stainless steel container. It's a cylinder, you can actually picture it as a big pressure cooker, and the process here is

generally that cage -- I don't think you can see it, but to the left there is a cage, the bin goes there, it automatically goes up and tips it off inside of the autoclave and then it shreds what's in there, then some amount of heating and pressuring like a pressure cooker does, and the heating comes by way the of steam, then during that process the steam sterilize the medical waste. It's going be a 20 to 30 minute cycle, and then after that we cool it by using water, and it has a double jacket, so we run water on the outer jacket to cool it. We cool it to about 80 degrees and then at the end we use vacuum to take off the excess steam

and also drain off the excess water. At the bottom will be the treated waste. This is what it will look like. Basically unrecognizable shreded and sterilized.

MR. CAMPBELL: Construction is anticipated to take four months and during construction we estimate approximately 28 persons will be employed. During operation we anticipate 14 persons being employed. The waste from this facility will be collected by a waste disposal company that has to be employed specifically to deal with this, and it will be transported to the Riverton dump.

Water supply to this facility will be by way of the National Water Commission. We expect to use approximately 7,800 liters per day, which the NWC has said that they can provide. Waste water basically will be

about the same. Approximately 1,200 will be from domestic waste and then the rest will be from the process of sterilization.

Now, there will be a buffer tank at the end of this process that will deal with the effluent from the sterile steam..., the low risk water that we use to cool

the autoclave and water from the disinfecting and cleaning of the trucks.

MR. CAMPBELL: This effluent is expected to meet NEPA standards base on what we have seen with other facilities.

Drainage in the area, the overall slope is 3.2 percent, and the elevation as you can see is anywhere between 1 to 2 meters high. Before the area was paved, because it was a parking lot,

and at the end it's going to still be paved, so there will be no net increase in run off expected. There are storm water drains around it and over the years with the heavy rains there have been no complaints of flooding, so we don't expect that there will be an issue with this process being placed there.

As part of the EIA process we have to look at the policy and legal framework in which the project is situated, and we have some agencies that we have to look to. we have NEPA and the Solid Waste Management Authority and Ministry of Health. There are some Acts that's listed here that we need to look at, Solid Waste Management Act, Clean Air Act, Public Health Act and the NRCA Act.

Then we have some regulations, permit and licence regulations from the NRCA. The New Air Quality Regs that were promulgated in 2002. Public Health Nuisance Act and also in terms of the prescribed areas in terms of Construction Development Order for Kingston and St. Andrew.

There are also some other policies, there is a Draft Medical Waste Management Policy for Jamaica and you have the Health Facilities Infection Control Policies and Procedure Manual and Solid Waste Management Policy and also there is a draft Hazard Waste and Substances Policy. There are other legislations that we have to look at as listed there and some Conventions.

Basic baseline environment, we had to look at the baseline environment to see

where and what we are putting this particular project correct in. So we had to do meteorology stuff and also geology, flora and fauna.

Generally the lowest temperature is in January with the rest of Jamaica and the highest is between July and September. The relative humidity range is between 60 and 80 percent and, of course, as with the rest of the island there are two main rain periods, of May to June, August to October.

The wind which is also important because of the nature of this project, winds are normally from east, southeast, and we have the wind speeds there, and we did one step further,

because that was the average wind over a year, so we did it monthly, and most of the winds each month blew to the west.

MR. CAMPBELL: Now, we looked at also natural hazards which could impact this project. Hurricanes as we know, earthquakes. This is in an area that has some amount of earthquake activity, and also we looked at any potential impact from flooding, and as I said before there are no reports of flooding in that area.

We also looked at the flora and fauna. For the flora the areas paved and the vegetation observed were mainly limited to the periphery, as is to be expected. A total of 12 species were observed. The vegetation on the site were not rare or endemic, so therefore the

potential for negative impact from this development is insignificant. And some ideas of what the type of vegetation we found: Woman Stung Tree, French

Cotton, Duppy Cotton and so on. There are some pictures here, just to give you an idea of what we saw.

For the fauna, due to the disturbed nature of the site, because it was a parking lot before and because there is limited vegetation, there were no fauna seen during the study.

We also looked at baseline noise levels because that's important, based on where it is and based on the operation of the facility. We took noise levels at eight locations. The average noise levels were not complying with NEPA's guidelines for silent zone because it's

close to hospital and 100 meters from the hospitals are schools, and are generally considered silent zones. Most of the noises that we found were influenced by cars, people talking, sound system, et cetera, general traffic. And just to give you an idea of where the noise stations are, if you look to the west you see the Kingston Public Hospital and most of it we concentrated around the proposed sight. As we can see, the average noise range from anywhere been 55.6 decibels to a high of 59.8. For silent zones 50 in the daytime and 40 at night is what the standard calls for, and this is just an idea of where that silent zone would be. You noticed the proposed facility falls well within the 100 meter limit.

We also looked at air quality, both respirable particulates and also total

suspended particulates. Both complied with the NEPA guidelines and standards. The average was for PM10, which is the respirable particulates was 27.24 over a year. That's the annual average. The standard nor NEPA is 50, so we are well within and from total suspended the average was 38.22, and the standard is 60, so both of them are well within NEPA standards.

MR. CAMPBELL: Carbon dioxide levels were in the levels that are expected for outdoor. We looked at nitrogen dioxide and sulphur dioxide and all were below the section limits of the equipment and they were low, well within the limits.

We also looked at the land use, both existing and proposed. Land use is suppose to be guided by the Kingston Development Order, which is a little

dated, 1966. It has a land use map and it deals with just generally residential, industrial, commercial, offices, open spaces, Government properties and statutory undertakings. The map on the next slide, this area where we are putting the proposed development falls in Government properties and statutory undertakings.

Existing land use of the park. The is the parking lot, you can see cars there, you can also see some skips with a worker pushing some domestic garbage to be placed in the skips, and also you can see the bottom pictures where you have some of the garbage being disposed of. Not from the KPH or Victoria Jubilee, but later on you will see, from residents living along Luke Lane because of the inefficient garbage collection there. Now, this is

proposed land use. If you look north you will see where you have the proposed site for the public morgue. That red rectangle or square I should say we intend to use for the realigned visitors park. The proposed site is just north of that. We are going to actually come down closer to North Street.

Also, we looked at the social base line in the area. We used a 2-kilometer from the proposed site to look at the social issues in the area. From the population census in 2001 that area we know has approximately 97,000 people.

There are more females in the population than male, and 15 to 64 age category was the major category of population, followed by the zero to 14. Population density in that area is

quite high. We have about 8,000 persons per square kilometer.

We looked at infrastructure in the area. We looked at electricity supply. This facility we expect to use approximately a 1,000 kilowatt per day. Water supply as we tell you the NWC has said that they can provide what's necessary. Waste water collection and treatment, there are sewer lines running there. Telephone and communication, sold waste collection and disposal, which is not optimal around that area. Roads and transportation, health care, fire, police and post office.

MR. CAMPBELL: We also did some community consultations. We actually had two sets. One we had a meeting at the Kingston Book Shop, Conference Centre, where we invited the

CDCs, so that each community has a leader and they were represented. We did some discussion there, and then after we went into the communities with questionnaires to the residents. So we did to type of consultations. What we got from them, that yes they are affected by the existing incinerator at KPH and the Blood Bank, and most of them saw that the development would not affect them where it's located. What they wanted was better garbage collection in their areas. As I said, the residents at Luke Lane are complaining the garbage truck doesn't come up that road, so they put their domestic garbage at the parking lot that we intend to use for the development. They also wanted better housing solutions. They saw crime as a major problem in their area. One of their concerns was that their children used over there as a recreation area and with us putting up the facility there it will be

fenced, so we are removing their unofficial recreation area for their children so they wondering what they going to do.

We also had add discussion with the KPH and Victoria Jubilee hospital staff. Their concerns were (1) who would manage the facility once established; where they are going to put their domestic waste now, because the area that we are proposing to put it is where they are currently having their skips and where they put their waste. They also wondered about the security of the facility and the car park, and they were also concerned about what will happen with ambulances trying get to the hospitals.

As with all EIA we have to look at alternatives, and one type that we have to look at is the no action. That is

the development doesn't go ahead. Now, if we look at the no action it will have minimal effect on the physical environment, it will stay as it's status quo but. However, it eliminates the possibility of improving the solid waste storage and disposal and aesthetics of the area. It would prevent reducing the environment of pollution which presently occurs because of inadequate waste collection. Eliminates the possibility of job opportunities and, I mean, unscrupulous persons will still use that area to dump their waste. The no action alternative does not guarantee that there won't be any impact on the flora or any other of the environmental areas around. With our project scenarios viewed as an unfavourable project alternative. We also looked at the proposed development. Number of

quality features including social, environmental and health opportunities for the local areas as well as the national health system, because there will be improvement in the whole medical waste treatment and disposal. There will be minimal impact on the physical environment. As we say it's an existing car park. To eliminate the use of incinerators and less complaint from the community and also reduce the potential for environmental pollution. And this is viewed as the most favourable project alternative. We himself looked at another location for siting of this project. One area that was suggested was Bumper Hall. This is 2 kilometre west of the existing site. It's in proximity to the remand centre. The distance we feel would increase the unit cost of treatment for the medical waste, so economically we think it's

not viable. And also the land reserved for the expansion of the May Pen Cemetery. This gives an idea of where we were talking. You can see our proposed medical waste is to the right and the remand centre is there to the west. The area demarcated with the red line would have been the area that would have been the alternative site.

MR. CAMPBELL: We also looked alternative technology. Incinerators we know, we already discussed why incinerators are not at good idea. Mechanical and chemical disinfectant normally uses chlorine, now it generally involves high maintenance. It uses a lot of water. The levels of metals and organics and other pollutants ...

(END OF TAPE 1 SIDE A)

(SIDE B, TAPE ONE)

MR. CAMPBELL: It also increases the dissolved solids,

which it which one would be an issue for NWC in terms of the sewer, and the cost is approximately US$350,000. Also, there is the microwave technology, which is generally a bigger version to what you have at home. It uses a lot of electricity, and I mean electricity cost here is astronomical. You would have to wet it a lot so you use a lot more water and it cost about US$ 500,000.

Irradiation which uses cobalt. The high cost of cobalt would be an issue. High operating cost because of that. We are not quite sure if it achieved its disinfection rate that it should, and there is a potential risk to the workers.

The impact and mitigation from this project: The first one during site preparation and construction, noise

pollution. That will be key because of the location of the proposed side. We expect that construction work will be done seven days a week for 16 weeks. What we propose as mitigation is to use equipment that have low noise emission. Restrict the operation of noise generating equipment to regular working hours. So at 2:00 a.m. in the morning we won't be working at 2 a.m. in the morning. Use equipment that has use equipment that have that are fitted with mufflers and other nose reduction facilities. For workers working with machines that generates a lot of noise, then the occupational part is important, so we would have to give them air muffs or air plugs as the case may be. And also to ensure that the equipment that's being used are properly tuned. Another potential impact is from air quality, and that's

from basically two sources. One, from the construction equipment and transportation. That is from exhaust and the other is from dust generated, treat with dust from site clearance, and also raw materials.

MR. CAMPBELL: The mitigation that we propose here is that we wet the construction site approximately every four to six hours to ensure that there is no fugitive dusts. We minimize the areas that are cleared, that we don't just clear all of it one time, we clear the areas that we are working on. Also to make sure that the materials like sand and marl are covered or wetted to ensure that there is no dust nuisance and also workers if they are working in dusty areas are given dust mask.

Employment: As we said before we expect 28 persons to be employed during

the construction. So there is no mitigation necessary. Sold waste is also another potential impact. What we propose is to make sure that skips and bins are placed around the construction site. They are covered to prevent odour and also dust and access to the vermins, especially if there are food in their. What we propose is to make sure that skips and bins are placed around the construction site. They are covered to prevent odour and also dust and access to vermins especially if there are food in there. Also we need to make sure that they are emptied regularly so that they are not over filled, and also we will ensure that the waste is disposed of at the Riverton Dump.

Waste water generation and disposal is another thing from the site preparation

and construction procedure. We say we will provide sanitary conveniences. Rule of thumb is normally one --- for 25 workers. Provide showers for the workmen and connect them to either the drain or the central sewage system that it doesn't run all over.

Transportation of raw material and equipment during the site preparation and construction process. The mitigation is that we will also ensure that there we have adequate and appropriate road signs, especially where they enter and exit the site because both Drummond Street and Princess Street are used a lot by traffic, and also the ambulances, so we have to make sure that they are adequate. Trucks must be covered. Also that the equipment and stuff must use established exit and entrance

points. Any heavy equipment that needs to be transported to the site should be done early morning with the appropriate pilotage and also ensure that flagmen are used to regulate the traffic flow during the construction period.

Storage of raw material: When you store raw material there is potential for pollution. We talk about the wetting, we also need to put them on hard stands and surround them by berms so that if rain falls or anything they won't wash into the drains. We must also make sure that the equipment are stored especially if they are working on them on hard stands. Any bulk storage of fuel should be clearly marked and also the type and quantity so people know in case of emergency. Also the aesthetic is another potential impact during site prepare and

construct phase. One way I think of dealing with waste and what the facility will be, is to ensure that the plant is painted in a colour that blends in with the existing environment. We don't necessarily need a bright colour building in that area.

Emergency Response: With any construction site there is always the potential for accidents, so the mitigation here is to have one person identified on site to deal with emergencies. Ensure that you have first-aid kits on site and also have arrangement with health facilities especially like the KPH which is close by, to deal with any eventualities. Also they must ensure that Material Safety Data Sheets are on site, so that in case any chemicals that we use, if

there is a accident then they know how best to treat it.

During the operational phase earthquake is a real possibility, because of the area. Because the structure is low rise the result in earthquake is either moderate to low, the hazard. Buildings are designed to deal with moderate to large earthquakes.

There will be need to develop an emergency response plan with ODPEM in terms of what to do in an earthquake, hurricane, et cetera.

Employment: We expect approximately 14 persons to be employed and also trained in dealing with waste collection, treatment and disposal, and no mitigation is required for that.

MR. CAMPBELL: Drains and water quality, storm water catchment will be the same. However, the quality can be affected by activities on the site. So what we propose here is that we properly slope and channel the surface so as to ensure that all is captured from the wash area. Then we place an oil wash separator before you discharge to the local storm water drain, to ensure that any oils coming off the trucks and stuff don't get into the storm water drainage.

We ensure that monitoring of deliveries. In medical waste during the operation we expect approximately 2 tons of waste to be treated within a 16 hour day. That's two shifts. We have to make sure that there will be adequate amount of bins and bags for each category of waste, because as we tell you the underpinning thing is waste segregation and minimisation. So

we need to make sure that if we are going to do the segregation we have the amount of bags and bins that we need to do it efficiently and adequately.

We also need to make sure that the waste are delivered to the plan on time. Ensure that the staff are adequately trained in terms of transporting the waste and also in terms of wearing their protective equipment. Also we need to make sure that the waste are carried to the dump on a timely basis. We don't want the waste sitting there for two, three days, we need the waste to leave each day to the dump.

We also have to ensure for longevity of this project, that preventative maintenance and the storage of adequate spare parts are done. A lot of

projects in Jamaica fall apart because of lack of preventative maintenance, I think this one, based on what we have been told has put in place the mechanism to deal with he preventative maintenance.

MR. CAMPBELL: As we said water supply is from NWC. They have said that they can supply it, so we don't expect it to have a problem on the existing water supply in the area. But that being said, we are putting in a storage tank that can store a four day water supply for the medical waste facility. We also will ensure that we use special washing equipment for washing down the stuff on the plant. We will use low flow water fixtures for the bathroom and showers that will be in the facility, so that we do our part in conservation of water.

We will also ensure that the waste from the facilities are carried to the dump; make sure that the effluent from the buffer tank, black and gray wash system should be placed in the public sewer after adequate treatment. We also will do periodic testing of the liquid effluent to make sure that there is not a high level of heavy metal, or bacterial content or volatile organic compound heading in our public sewers. This holding tank or buffer tank would have a retention time of approximately two days, so it gives us adequate time to do the testing before we release it to the public sewer.

We also say we put batteries in there to allow for the removal of oil and grease. Oil and grease will cause blockage in the sewer system. To top

it off we recommend that we install gas chlorination system at the start of the holding tank just as a precautionary measure. Of course we do the routine monitoring of the steam and wash down area to make sure that all is functioning as we anticipate.

MR. CAMPBELL: We expect for transport and traffic during the operation of the facilities that the trucks will make one to three trips to the facility per day. So we have to design the road along Drummond Street to make sure that we can see clearly, because a lot of traffic including big JUTC buses use that road, so we don't want any accidents happening. We have to put adequate signs. One suggestion, if possible, is delimit delivery of these trucks during period of low traffic flow. We recommend that the persons driving these trucks eliminate the use of horns or

revving the engine unnecessarily in proximity to facility, both because of noise and because of air pollution.

Emergency response during the operational phase: We place first- aid kits and spill clean up kits in the facility, and also on the collection trucks. We make prior arrangement with hospitals, coordinate with mutual aid organizations such as the Fire Brigade in case we have problem with spills and stuff.

Train the staff, and for the fire hydrants we ensure that there are adequate amount of fire hydrants in and around the facility. We have been assured by the Fire Department that there are more than enough working fire hydrants in the area.

Air pollution is a potential problem during the operation, because it can emit unpleasant odours if not operated properly. So one of the mitigation methods here is to have a roof aeration system, so that we suck the air to the roof once you open the autoclave. We also ensure daily removal of waste. We don't want it to stay there and get odorous, and we also said we would make sure that the waste bins are kept closed and if all fails then we use deodorizers and odour reducing agents.

Based on good safety planning and use of protective equipment then we should reduce or eliminate spills. Also to make sure that there is no hazardous things coming into the plants such as radioactive waste. We have to ensure that there is proper segregation, so the staff has to be trained both at the

health care facility and at the medical waste treatment plant, so as to ensure that none of these get into the autoclave.

The operation of the facility will involve noise generation, the whole grinding thing. What we did, we did some modeling, so we have a fair enough idea of what the noise levels will be, and some of the mitigation methods that we propose is to ensure that this facility or the autoclave grinder is maintained properly. We also insist that the boundary walls to the east and north, east is along Luke Lane, north is along Drummond Street should be maintained, and that will act as a noise buffer. Where possible we would operate the facilities with the doors closed, but in the EIA what we had also suggested is that upon the construction

and the first operation that we do a preliminary noise measurement just to make sure that we are within what the model noise level said that it should be.

As we said before trucks and other vehicles should not use their horns in that area and also prevent the unnecessary revving of engines.

MR. CAMPBELL: Occupational health and safety is a real potential issue, because as we said we are dealing with infectious waste, so the workers that are handling it we have to ensure that they are adequately trained, and have the required PPEs to deal with their situation. We also have to ensure that the facilities is designed that there is little potential for injuries such as we don't need to be lifting the heavy stuff. That is one of the reasons why it's a mechanical autoclave and also the

red bins have wheels so they can push them along. We have to ensure that they have the adequate personal protective equipment or PPEs. We said we have to make sure the waste is segregated properly. We have to make sure there is proper management of autoclave operation.

We also have do an Environmental Monitoring Programme, and this is what we suggested. Daily monitoring do ensure that the cleared areas and access road, this is during construction, are not creating a dust nuisance. We do daily inspection do ensure that the construction activities are not taking place outside regular working hours. We also undertake daily inspection of trucks carrying raw materials to make sure that they are not overlaid, also they are covered and not spilling any of the raw materials

along the way.

Daily monitoring of vehicles if they are going to refuel on the site, to make sure they are done on hard stands. Make sure that the building plan that has been submitted is being followed for both drainage and building.

Anybody who wants to sell food to these construction workers we suggest that they are placed in a designated area. This is something that we going to have to work out with KSAC to ensure you don't get a whole heap of people around the area, we have an orderly thing.

We also have to make sure the trucks and heavy equipment are parked in designated area and not blocking the road. A we have said, one of the concerns from the KPH and Victoria

Jubilee workers or staff is that the ambulance is used around there and if we have these equipment in the road it might restrict the free movement of these ambulances. We also have to ensure that there are flagmen in place and the signs are up. We need to make sure that the amount of sold waste that's generated is actually disposed of at the Riverton site and not along the way. Also have to make sure that the portable toilets are in proper working order. We also have to make sure that the materials that's being used are local and are registered specially from the quarries if we going to use any quarry. If possible construction crews will be sourced from the studied area.

During operation then we undertake monthly inspection of the drainage and

waste water system to ensure that they are being operating as how they were designed. We said quarterly monitoring for waste water effluent in the buffer tanks for VOCs, heavy metals and bacterial contents. And we say using parametric monitoring we validate biological indicators to make sure that the autoclave is actually sterilizing the medical waste as it is designed, and we say we do this quarterly for the first year and annually thereafter. Thank you. If you have any questions or comments.

CHAIRMAN: Thank you very much, Mr. Campbell for the very thorough handling of that. We are going to take questions. Would you please make sure that you press your microphones so that we can get the questions recorded, and could you just state your name and your affiliation. Thank you very much.

MS. ANDRADE: My name is Danielle Andrade, I am from the Jamaica Environment Trust, and I really don't have a question, it's more a comment. I just wanted to say that having had the EIA reviewed we feel that this project is soundly designed, and we are in support of it, because it uses capable technology with a proven track record and in particular we support the fact that it will address the existing situation with the burn boxes or incinerators that are contributing to the air pollution in the area. I just came here really just to say we are in support of it, I didn't have a question or comment.

CHAIRMAN: Thank you. Questions anyone? Remember that there are 30 days after that you can kind of think and cogitate on what you heard today and formulate the questions which you would put through to NEPA. No

questions. It's only left for me then to thank Mr. Campbell. I was thinking of some questions myself but Mr. Campbell was very thorough in his presentation.

MS. FEARON: One quick question. I am Natalie Fearon from NEPA. Once you done the sterilization and it has to move to the landfill is there a designated area where this particular waste will go or it's just going to be included in regular sold waste.

CHAIRMAN: That's at the landfill?

MS. FEARON: Right.

MS. HYLTON: Navarine Hylton from the Ministry of Health. Firstly I will say I am not sure what Solid Waste position is on the issue, but based on information I have obtained from other countries where the system is in operation and there isn't a sanitary

land fill, more or less they have a similar controlled dump site as we have here in Jamaica. It's not a requirement of their Environmental Authority or whomever that manages that landfill for them to have it disposed of at a designated site, and the reason for that is because of the level of sterility of the treated waste. That waste that is coming out of this treatment facility is in fact far more superior in terms of sterility that the actual domestic municipal waste that is being disposed of at the facility. So in essence, whether it is a sanitary landfill or a controlled landfill it can actually be handled in similar a method as domestic waste, based on the sterility factor of the waste itself.

Another point to highlight here is the fact that the standard which is set by

this, what they call Stats, it's the regulatory agency in the United States that develop the standards for all alternative treatment technology. They have actually specified the minimum sterility level that must be attained, and this is the only non-alternative steam sterilization technology on the market that actually exceeds the sterility level set by this regulatory institution.

MS. HYLTON: There is one other comment I will make as it relate to the effluent, and this is related to the waste water aspect of it. In the presentation Carlton had indicated the double chamber system and the cooling aspect of it. What I want to emphasize here is that based on the chamber system of the treatment facility or the equipment itself, the water that is used to cool the process of this facility, at a no time

comes into contact with the waste, whether treated or untreated waste, and hence what you basically have is just a high temperature water coming out of the facility. Notwithstanding, because they condensate in the chamber where the waste is treated, which is in fact sterile, will be vacuum and joined with the waste water effluent from the cooling system. The proposal for us, just to make sure that from a NEPA point of view as well as from the NWC point of view, to verify the quality of that water we put in place the buffer system to collect, that allowing the water to come down to ambient temperature before it can be discharged into the public sewer, and also allowing us to testing of that water quality to verify the fact that it would basically be as clean as the water entering into the system. So I just make that clarification.

Also, with respect to the on site run off, so to speak, one point I want to emphasize is that the trucks in coming into the facility, which is only trucks making a maximum of one to two trips per truck, will actually be offloading the waste bins inside of the treatment building. So the possibility of any spillage taking place on the outer compound is quite minimized firstly, and secondly the sanitisation of the truck will be taking place in a designated area, which that water will be streamed to an oil water separating system before that is channelled into sewer the system. So there is that three fold management system being put in a place to deal with the actual effluent, so to speak, coming from the system.

CHAIRMAN: Thank you. If I may be permitted a

question. What source of energy is being used to raise steam. If it's oil, how are you going to deal with that on the site, or were there any sympathies taken with the next door steam generation equipment.

MS. HYLTON: The source of steam generation will actually be an electric boiler, because the treatment equipment in itself uses electricity as its source of energy, so one of the main things for us was to make sure that all equipment uses the same source of energy to minimize any conflict, so to speak. In assessing the steam generation capacity of KPH, it wasn't sufficient to facilitate our plant and hence it has it's own independent boiler system. Another consideration that was done is the fact that because -- in the initial phase the facility is really dealing with public facilities,

notwithstanding though it is the responsibility of private entities to put in their treatment system as mandated by the policy and the new “regs” to come, we as Government also have to provide a solution, and hence the plant in itself in terms of the footprint is designed with the space to accommodate an extra sterilization system, and hence the boiler that is being put that will be installed will be of such capacity to provide for future increase in the treatment capacity of facility in the long term.

CHAIRMAN: Go ahead.

PARTICIPANT: In your description of the process itself and the different items that are going to be covered, it says here that it includes tissue, organs and body parts. Those are also going to be part of the shredding and autoclave cleansing process? And then

after that happens now, because I am just thinking in very basic terms, I am not a scientist, if I cook something it can still go bad after being cooked and can still have some consequences. If you could explain that part to me, how will that component be handled, and if it's a lot how can you balance it against just the medical waste like gauze and all of that and the other things that are shredded

MS. HYLTON: In the whole health care facility in terms of generation of medical waste -- of course there are different categories of medical waste. You have the sharps, the infectious waste the pathological waste, et cetera. Unfortunately there isn't any information available locally that indicate the percentage, so to speak, of each individual category. Nonetheless, the pathological content is quite small

compared to that of say the gauze, the gloves, the other disposable items that are used. Now, the fact that we will have segregation at a the hospital level, which currently obtains, it just needs to be improved, the idea is to have a mixture of waste going in to one treatment cycle. So, for instance, you may have, for example, I am not quite sure what it is now, because that would come out into the training aspect of it, but probably you might have a 5:1 ratio, et cetera. So the end product that you are actually seeing you won't be able to identify whether or not body parts would have been a component of that cycled waste. So you put in maybe a bin of body parts, five bins of other stuff, whenever everything mix together you can't really determine what exactly it is.

CHAIRMAN: Thank you for that question. It boggles

the mind. I am quite sure if you look around us there are not many people walking around with much missing from their bodies, so I am quite sure that amount is very small. Are there my more questions.

CHAIRMAN: Thank you very much everybody for coming. It's only left for me to bring this very interesting meeting to a close. It's so unfortunate that we can't get our stakeholders out to -- you want to say something that.

MR. HUTCHINSON: Ronnie Hutchinson from NEPA. In regards to the body parts, I am thinking that the shredder, I am thinking it would shred, and as such the potential for it to get clogged is there. I just want to know what exactly will be put into the autoclave in terms of bow parts I am thinking skulls and like severed legs and

stuff would be there.

MS. HYLTON: I think the response to that would be, the largest single component of a body part that would go in it would most likely be a limb. For the most part, even though we say body parts, it's really tissues and that sort of thing that is removed for autopsies and that sort of a thing, so to speak, but in any event you will have a limb -- you have two CEO's from the hospital so they can correct me if I am wrong. Nevertheless, there are two points I'd like to point out where this is concerned. Firstly, the technology that is used in constructing the shredder in itself, was somewhat detailed in the EIA. It is more or less what we would call revolutionised in the sense that it is a reversed system. So it kind of counteract any potential clogging that would likely to take place in the shredder aspect of

it. In other words, it wouldn't go in one direction. So it goes one direction for a minute or 30 seconds and it reverses direction, so it has its capability of off loading. Saying that is one thing. Yes, possibility of clogging can occur because we are have living in a real world. Now, (a) the system in itself is built with what is called safe cycle. Now, the operator, of course -- first of all, it will indicate when there is a failure in the system, what exactly is the failure, where the failure is and what action is to be taken. The operator more or less will have to activate that fail safe system which conducts or carries out sterilization of all materials that is in the chamber at the time that clog, so to speak, or whichever other mechanical challenge that would have occurred. Further to that the waste would then be offloaded. (a) If it is as case where it

can be fix inside, whatever technicality, then it will be done. If that's not the case he had spoken about spare parts. Most of the essential spare pair parts for the system, the trough, everything is being purchased with the system in itself, and that includes an alternative or an additional shredder. So therefore it can be replaced, the cycle continues, everything complete while that is being repaired. So you won't have much delay, so to speak in it.

MS. HYLTON: What I would like to emphasize here is that built into the Purchase Agreement with the system is that the manufacturer will be required to train the operators and also have a transfer of knowledge taking place, and there is also an component where if it is requiring that time level technical expertise that was not included or provided in the training

then they would become available within 48 hours. And what I may add here is that the representatives are actually located within the Caribbean and for any comfort St. Lucia installed this facility for the last three to four years, in 2004 without operating without any malfunction, anything happening to date. Of course you would imagine medical waste is similar across the world, so to speak. So that being said I don't expect any major challenges. Of course, one of the main things that will help us significantly is what takes place at the hospital level and that is why to date, these representatives here can speak, we have already started over a year to two years now training of all hospital staff, and that process is ongoing as we speak, et cetera. I think I went over board with that. Anyway, just to make that clarification. I really encourage more questions from NEPA

wherever there is doubt, because it provides that avenue to help clear up issues.

MR. ANGLIN: Henry Anglin, Bustamante Hospital. You mentioned spare parts will be there, but my query is, is there redundancy in the system to take care of the waste build up, so there is no waste build up while we wait for repairs to be completed.

MS. HYLTON: Yes. In the sense of storage, for example -- okay, in the event for example say a hurricane, for example, not necessarily a technical failure of the system, or power failure -- he though for power and water we will have back up facilities -- but in the event the facility will be closed down or whatever, obstructing of servicing taking place there, we have a twofold storage capacity system being planned. The bins that will

be used to transport the waste, actually will not just have -- I think it's up to three days storage capacity that will actually be available at the health care facility, and whatever waste that would have been at the treatment site would be stored in the refrigerating container in the case of the pathological waste, for example, and other waste can be stored inside the building in the air tight stuff. So the total storage capacity both in terms of the building as well as in terms of hospital, et cetera, can provide for up to a maximum of seven days, but we do not foresee any such thing taking place. The alternative that is being planned with respect to treatment should we have a back up, a stockpile, so to speak, is to divert the waste to incinerators that are -- I think there are three of them being identified, May Pen, Mandeville and St. Ann's Bay. So the

waste would be diverted to those incinerators for treatment in the interim. Those are the three incinerators that are close to par with NEPA Regulation, including the new regs and may requires just minor retrofitting to meet the new regs that are in place. Of course Carlton had mentioned in his presentation it is four of these systems that is expected to be installed. We anticipate that that second system would go into the western region to take care of that side of waste, and so once all of them are put in a place most of them you can rely on each of them in terms of networking for that back up.

MR. ANGLIN: Another thought came to me, several references were made to noise pollution. Has there been any thought to noise cancelling technology?

MS. HYLTON: To be honest with you -- you want to take

this one?

MR. CAMPBELL: What we had done was based on the noise generation from equipment, we did a noise modelling based on the facilities, the walls of the facilities, and we also looked at a what the noise would be generated at the various points. At residence along Luke Lane, the church, the hospital, because that's important, and the levels that we got from the modelling would suggest to us that there would be no net increase in noise at a those locations, because the difference in what the project will generate is more than 10 decibels and the background noise. Once you have a difference of ten or more then there will be no change to the higher noise level, so at a this point it is not necessary. But, as we said in presentation, one of the suggestions or one of the mitigation that we had

suggested is that after the set up and running then we will go through and to actual noise readings at a these points, to make sure that the noise are not exceeding what they are there. If at that stage there is a problem then of course we deal with how best to deal with noise cancellation, but at this point there shouldn't be a problem based on the walls that's there and base on the levels that we model it to give, then there shouldn't be an issue.

MS. HYLTON: Just to adds one point to it which wasn't really a part of this EIA, is the fact that a complete what I call master plan for the entire site, including the parking lot, is currently being prepared as we speak now, and one of the proposals is actually to have wall fence around the entire property, so not just the existing wall fence, so that will even further

minimize the impact on the surrounding community.

MR. HUTCHINSON: I am not sure what takes place now re hospitals and chemical and radioactive waste. In the presentation it was stated ...

CHAIRMAN: They are excluded from the facility.

MR. HUTCHINSON: What will be done with these waste with this system seeing as though it won't be a part of that.

MS. HYLTON: One thing I would like to highlight here is that currently even the incinerators that are being used for the treatment of medical waste on site they to not treat the chemical waste or the radioactive waste. As we know radioactive waste can be treated by basically storing it into drums or specified container for over a

period of time to bring it down to different half life and that sort a thing. That is what is currently being practiced now. As it relates to chemical waste, for example, say cytotoxic drugs, there is no facility available nationally to deal with that.

(END OF TAPE 1, SIDE B)

MS. HYLTON: Sold waste, Ministry of Health, trying to have those being burnt into the cement kiln, but of course that was put on hold because of the whole saga with the cement and that sort of thing, et cetera, et cetera. I know also that there is a project that the Cement Company is also looking into in getting -- I am not sure if other chemicals are included, but like tires and that sort of thing being burnt in it, because those chemicals can only be treated in special incinerators that goes

above 1,800º Centigrades, so in terms of the cytotoxic drugs, I know they are being stockpiled now, fortunately it is not that great quantity -- we still have a storage problem anyway. In terms of other chemicals now I think there are different methodology being used, for instance, dilution, treatment, for example, et cetera. I am not quite versed in that area but it is being managed to my understanding, so it's not an issue. Your concern, however, as it relates to the treatment facility now, is the fact that in a hospital setting, health centre setting, the different categories which there are three categories, the general waste, medical waste, and what I call special waste, radioactive chemical waste, are generally in a most cases generated in different locations, so the possibility of having chemical and radioactive being mixed with medical waste or with

infectious waste is quite minimal. So that possibility is not expected to really occur. The challenge that we have now is the domestic kind of waste being mixed with the infectious waste, and that is what we are aiming to have the minimisation of that taking place to overall reduce the quantity of what we call infectious waste. Once you have the mixing everything has to be treated as medical waste or infectious waste.

MR. HUTCHINSON: I understand that and I would expect that is what was going to be done. However, the chemical and the special waste, as you put it, the concern of how it is going to be done, how it is going to be treated compared to what is presently being done, I am just saying maybe that could have been incorporated to us so that we can say all right, this will be continued.

MS. HYLTON: Okay one thing we have to recognize is the fact that the scope of this project is specific to infectious medical waste, which is what is being treated in the incinerators that are being replaced, so to speak. So I am sure the Ministry of Health recognize this as another concern and I am sure in the very near future they should have something to deal with that. However, what I would like to add though, is the fact that hazardous waste or special waste is not just an issue for the health sector, it's an issue nationally, so I think it will require more than just a Ministry of Health leading the task, but perhaps the Environment Ministry such as NEPA -- well, not the Ministry, but you understand the Environmental Agency or the Ministry of Environment or whomever, whichever body to lead that as a national project rather than a sector by sector, because all those wastes can be grouped

and treated as such.

MR. ANGLIN: I must say for radioactive material they are never disposed of. The closest we might come to disposing of anything radioactive is when you use radioisotopes for x-rays studies, and those have half life of minutes, so they are fairly safe once they are used and disposed of, but the real radioactive material is never disposed of, they have very, very strict controls.

CHAIRMAN: Every time I try to close off the brains come alive again. Maybe if I give you another minute or two there may be some gems coming forward. While we think of that I don't mind being disturbed, because it helps the whole process the more that comes and remember that this process is being recorded, and so that you can always get that from the -- it's going to be on a

NEPA website actually.

CHAIRMAN: Let me thank CL Environmental, Mr. Campbell, for his presentation, very thorough. I was especially delighted with the way that the impacts were treated and the way that the mitigations of each impact were treated in a some detail, which should help in the overall project implementation in ensuring that a most environmental friendly project is created.

I must thank you for coming, those of you who came from out of town, and even though the numbers were small the quality of your questions were probing and helped in the overall process. Thank you very much from the Ministry of Health, for putting this on and good night.