TAMPERE POLYTECHNIC
Degree Programme in Environmental Engineering

Final Thesis

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WASTE MANAGEMENT PLAN FOR FARMARI 2005 AGRICULTURAL FAIR OF FINLAND

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ABSTRACT

The Waste Act in Finland states that any waste produced must be put into use if it is possible and in comparison with other means of waste management no excess cost will come from using the waste. Primarily the material the waste is made of is to be reused. The secondary aim is to use the energy the waste contains.

Some municipalities also have their own waste regulations. For example in Tampere the organiser of a public event is responsible for organizing the waste management. People taking part in the event have to make sure as little waste as possible is produced.

When planning a public event, it is good to take into consideration the Waste Act as well as other waste regulations in the region. All the areas of the waste management should be included in the planning. If the waste management is planned well the personnel working in the event will not have to worry about the waste management during the event. Planning the waste management also helps reduce the waste produced and might also lower the costs of the waste management.

The main purpose of this work was to compose a working waste management plan for Farmari 2005 Agricultural Fair of Finland. The purpose was also to find out the waste regulations related to public events in Tampere area and how they could be met in the event. Finding out the best ways to recycle the waste was important for the work as well as finding out financially best and environmentally friendly waste management solution for the event.

The work does not include the results of the waste management in Farmari 2005 Agricultural Fair of Finland due to the lateness of the event. However, a prediction how the waste management plan could work in practice is presented in the work.

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TIIVISTELMÄ

Suomen jätelaissa sanotaan, että syntynyt jäte on käytettävä uudelleen mikäli se on mahdollista ja mikäli jätteen uudelleenkäyttämisestä ei synny ylimääräisiä kustannuksia. Ensisijaisesti jätteen materiaali tulee käyttää uudelleen. Jätteen sisältämän energian hyödyntäminen on toissijainen tavoite.

Joissain kunnissa on alueellisia jätesäädöksiä. Esimerkiksi Tampereella yleisötapahtuman järjestäjä on vastuussa tapahtuman jätehuollon järjestämisestä. Tapahtumaan osallistuvien ihmisten tulee pitää huolta, että mahdollisimman vähän jätettä syntyy tapahtuman aikana.

Yleisötapahtumaa suunnitellessa on hyvä ottaa huomioon jätelaki ja alueen muut jätesäädökset. Jätehuollon jokainen osa-alue tulisi olla sisällytetty suunnitteluun alusta alkaen. Jos jätehuolto on hyvin suunniteltu, tapahtuman henkilökunta ja vieraat eivät joudu miettimään jätehuoltoa tapahtuman aikana. Jätehuollon huolellinen suunnitteleminen auttaa vähentämään syntyvän jätteen määrää ja saattaa jopa pienentää jätehuollosta syntyviä kustannuksia.

Tämän työn tarkoituksena oli suunnitella toimiva jätehuoltosuunnitelma Farmari 2005 Suomen Maatalousnäyttelyä varten. Tarkoituksena oli myös selvittää yleisötapahtumiin liittyviä jätesäädöksiä Tampereella ja kuinka säädökset voitaisiin toteuttaa tapahtumassa. Parhaan mahdollisen kierrätystavan selvittäminen sekä taloudellisesti ja ympäristön kannalta parhaan jätehuoltotavan kehittäminen olivat työn kannalta keskeisiä.

Työhön ei ole sisällytetty jätehuollon tuloksia tai loppuraporttia Farmari 2005 Suomen Maatalousnäyttelystä tapahtuman myöhäisen ajankohdan takia. Työssä on kuitenkin esitelty ennuste siitä kuinka jätehuoltosuunnitelma voisi käytännössä toimia.

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1. INTRODUCTION

This is a Final Thesis for the Degree Programme in Environmental Engineering, Tampere Polytechnic. The topic of the thesis is Waste Management Plan for Farmari 2005 Agricultural Fair of Finland. The waste management plan was done between autumn 2004 and summer 2005. The thesis was commissioned by ProAgria Rural Advisory Centre of Pirkanmaa (Pirkanmaan Maaseutukeskus) in September 2004.

The general waste management of the area, department of the domestic animals, waste management of the restaurant and cafeterias and toilets are included in the waste management plan. Cleaning up the area is also partly related to the waste management but it has not been included in the waste management plan in great detail. The reason for this is that cleaning has been agreed to be done by independent entities and not as a part of the waste management.

The process of making the waste management plan is presented in this thesis. Some information about the fair itself as well as the environmental impacts of public events is also included. The results of the waste management plan in practice are not included in this thesis. This is due to the lateness of the date the fair was organised.

2. FARMARI 2005

2.1. General Information

Farmari 2005 Agricultural Fair of Finland (from now on: Farmari 2005) is held in Tampere, Finland July 28th through July 31st, 2005. The place for the fair is Tampere Exhibition Centre Pirkkahalli and it’s surroundings. The area consists of three indoor halls, altogether two (2) hectares. There is about eight (8) hectares of outdoor areas. Farmari 2005 is the most important agricultural happening of the year and about 90 000 visitors are expected to the fair. Most of the visitors at

Farmari 2005 are expected to be farmers but the fair also attracts tens of thousands other people too. (3, 1)

In Farmari 2005 there are three different exhibitions. The Agricultural Exhibition includes the departments of livestock and domestic animals, agricultural machinery, agricultural building and materials, forestry and wood-energy and fishing, hunting and outdoor activities. The Home In the Countryside Exhibition includes areas of traditional building and building materials, interior design and farmyard and garden. The Agricultural Entrepreneurship Exhibition includes rural tourism services, food products, crafts and Finest Products of the Provinces (Maakuntien Parhaat). Over 550 exhibitors are expected to attend Farmari 2005. A map showing the area of the fair as well as the halls can be found from the appendix Jätehuoltosuunnitelma. (1, 3)

Farmari 2005 is the seventh Farmari Agricultural Fair held in Finland. In the spring 1998 ProAgria Rural Advisory Centres and ProAgria Association of Rural Advisory Centres decided to renew the agricultural fair. Ever since 1999 only one national agricultural fair has been held annually. In the 1960s the number of agricultural fairs in a year was agreed to be four. However, in 1979 it was agreed that three agricultural fairs was to be organised annually, most of them were organised during the summertime and some during the wintertime. This was done until the year 1999. (4)

2.2. History

The tradition of the agricultural fairs in Finland began in the middle of the 19th century. The first general agricultural gathering was held in Turku in 1847. The purpose of the gathering was to promote all fields of agriculture to “a higher perfection”. Gradually the gatherings changed into a review of the Finnish agriculture. Tools and methods of farming were presented already in the 1850s. (4)

The first actual national agricultural fair was held in Helsinki in 1870. This fair was the first one to include a department for the livestock. The aim of including the animals in the fair was to change the direction of the agriculture from crop cultivation into dairy cattle herding. (4)

During the years after the Second World War the fairs were usually organised by provincial or other agricultural societies. In 1950 there were 523 different fairs and exhibitions. The target group of the events was mostly farmers and the aim was to present new technology and working methods as well as showing the best animals in the country and developing the professional skills of farmers. In the fast-mechanising Finland agricultural machinery and equipment became the most important part of the fairs and exhibitions in the 1950s and 1960s. (4)

In the 1960s the responsibility for organising the growing agricultural fairs was moved to the agricultural societies and the number of fairs and exhibitions was decreased to 10-15 per year. In the 1960s the number of fairs organised was agreed to be four and so was done until the year 1979 when ProAgria Association of Rural Advisory Centres and Traktorinmyyjät ry agreed that during the years 1981-1990 three agricultural fairs were to be organised annually. Since the year 1999 one national agricultural fair has been organised per year. This fair is called Farmari Agricultural Fair of Finland. (4)

2.3. Tampere Exhibition Centre Pirkkahalli

Tampere Exhibition Centre Pirkkahalli has more than 22,000 m^2 (2,2 hectares) of area for happenings such as sports events, exhibitions and fairs. There are also seminar facilities in the second floor of the Exhibition Centre. Pirkkahalli consists of three halls, which can be connected together with hallways or used as separate halls. The Exhibition Centre is located in Tampere, near the border of Pirkkala, hence the name Pirkkahalli. (7)

The biggest and the oldest hall, Hall A was built in 1985 and the area is more than 11,000 m^2 (1,1 hectares). The area of the small Hall B, next to Hall A, is about 2,300 m^2 (0,23 hectares). The newest part of Tampere Exhibition Centre Pirkkahalli was built in 1998. It is Hall C, which is 8,500 m^2 (0,85 hectares). All of the halls are equipped with automatic fire extinction system. Image 1 shows Tampere Exhibition Centre Pirkkahalli so that Hall C is in the front of the picture. The bigger hall behind it is Hall A and the small hall behind Hall C is Hall B. (7)

Picture 1. Tampere Exhibition Centre Pirkkahalli. In the front is Hall C, in the upper left side is Hall A and behind Hall C is Hall B. (8)

3. ENVIRONMENTAL ASPECTS OF PUBLIC EVENTS

3.1. General About the Environmental Aspects

During a public event a lot of waste is produced, disposable items are used and noise and possibly other disturbances are generated. Energy is used and wasted a lot since electricity is needed and often roads around the event area are crowded.

Public events are visible and often the problems arising during the events are discussed in the media. (2)

Many people choose the event they take part in by the acceptability of the event, common experiences and one's own social status. By making environmentally friendly decisions when planning a public event the organiser can show the respect of values which are common with the people aware of the environmental issues. Well-functioning waste management reduces the effects of waste in public events and the environmental image of an event can be more positive. Preventing the waste production also reduces the trashing in the event area and the need for cleaning up after the event will be smaller. (2, 6)

3.2. Environmental Laws and Regulations

In the Waste Act in Finland is said that the waste must be put into use, if it is possible and no excess cost will come from using the waste in comparison with other means of waste management. The primary aim is to use the substance the waste consists of, the secondary aim is to use to energy of the waste. (§6) In addition, municipalities give their own waste regulations, which are to be followed locally. (5)

Some cities give waste regulations, which include sorting the waste also in public events. According to the website of the City of Tampere, the organiser of the public event is responsible for organizing the waste management. All the people taking part in the event (for example in Farmari's case the organisers and the companies presenting their products) have to make sure that as little waste as possible is produced during the event. The most important thing is to prevent the waste production. The second important thing is to make sure the waste produced is taken into use, as said in the Waste Law as well. (6)

4. WASTE MANAGEMENT PLAN

4.1. General About the Waste Management in Farmari 2005

4.1.1. Waste Management

Because Farmari 2005 Agricultural Fair is a large event, the waste management plan is extremely important. The waste management should be planned so that it is easy to carry out but at the same time it should be effective. Having a working waste management at the area helps the visitors as well as the exhibititors enjoy the event without having to think too much about where to put their waste.

The waste management plan was started in autumn 2004 with meetings with the Exhibition Manager Päivi Pyyvaara. The meetings continued during the winter and in the beginning of the year 2005 a meeting was held with the representative of the waste management company Lassila & Tikanoja. During the spring 2005 several meetings were held with the staff responsible for the electricity and the water supply of the fair. Several meetings with the person responsible for the restaurants and the food in general were held.

4.1.2. Timetable

The construction of Farmari 2005 will begin on Monday, July 18th. The demolition and cleaning should end on Monday, August 1st and the area should be empty on Tuesday, August 2nd. This means the waste management takes place in between Monday, July 18th and Tuesday, August 2nd. However, the most crucial days for the waste management are the days the fair is on. In practice it means from Thursday, July 28th to Sunday, July 31st.

On July 18th, which is the first building day for the fair, two demountable platforms will be brought to the area. One will be located near the main entrance of the area and another one on the other side of the halls. Mixed waste will be collected to these platforms and the platforms will be taken from the area before the fair starts

on Thursday July 28th.

The first day of the fair will be Thursday July 28th. By this day the waste compressors and other waste collection containers and bins will be brought to the area along with the portable toilets. When the fair is opened to the public, it is important for the waste management to be working properly. This means that the waste management personnel have to go around the area before the fair is opened at ten o'clock in the morning.

In the evening after eight o'clock the biodegradable waste (including the manure) will be taken away from the area. The pathways will be swept with a road-sweeping lorry. During the day the waste management staff will go around the area emptying the waste bins into bigger containers and making sure there is paper in the portable toilets and so on.

On Friday July 29th the waste management should be quite simple compared to the previous day. In the morning before eight o'clock the portable toilets will be emptied and washed. The portable toilets will be checked before ten o'clock to make sure they are in good condition and chemicals will be added to prevent the smell. The toilets will be checked a couple of times during the day by the waste management personnel to make sure there is paper in the toilets and the toilets are in good condition. The waste management personnel will also go around the area emptying the waste bins into bigger containers several times a day. In the evening the waste management will be the same as on Thursday but also the waste compressors and waste collection containers will be emptied in the evening after eight o'clock.

Saturday July 30th will be the busiest day of the fair with the most visitors during the day. This is why the waste collection containers have to be emptied already on Friday evening. The portable toilets will be emptied in the morning as on Friday. The toilets have to be checked and chemicals have to be added. The waste management will be similar to the previous days during the day and in the evening the waste management will be the same as on Thursday.

The last day of the fair will be Sunday July 31st. The waste management is going to be similar to the previous days. No waste collection containers will be emptied during Sunday because the containers will be removed from the area during Monday and they can be used during the demolition. However, the biodegradable waste will be taken away from the area and the demountable platforms will be taken away from the area as well.

On Monday August 1st seven demountable platforms will be brought to the area for mixed wasted which will be produced during the demolition of the fair. The waste collection containers and portable toilets will be taken away from the area on Monday and the demountable platforms will be taken away on Tuesday when the area must be empty. Once the area is empty, the outdoor areas will be swept with a road-sweeping lorry.

4.2. Restaurant and cafeterias

4.2.1. General

In the area of Farmari 2005 there will be one restaurant and four cafeterias. Three of the cafeterias will include a grill; one of them will be Portaat Luomuun, organic cafeteria. The amount of food served in the restaurant is 16 000 servings during the event. In the grills 5 000 servings of Scandinavian hash and 8000 sausages are served. The food served in the restaurant will be heated in the kitchen of Koivistonkylän Ammattioppilaitos, a school located in Koivistonkylä, a couple of kilometres away from Farmari 2005 area.

The waste management for the restaurants and cafeterias is one of the most important parts of the waste management because the amount of waste produced is large. A map showing the locations of the waste containers and compressors can be found from the end of the appendix Jätehuoltosuunnitelma.

4.2.2. School Kitchen

The food supplies will be brought to the school kitchen in cardboard boxes with possibly some plastic or other wrappings protecting the food supplies. Therefore most of the waste produced in the school kitchen is cardboard and other wrapping material such as plastic. Small amounts of biodegradable waste can also be expected from the kitchen.

Outside the kitchen there is a waste collection point, which will be in use during the Farmari 2005 fair. The waste collection point includes seven 600 litre bins for mixed waste, four 140 litre bins for biodegradable waste and two roller conveyors for cardboard. These bins and roller conveyors are emptied every day during the time there are people working in the kitchen because the waste collection point is in an area, which will be locked during the night. In practice this means in between 8 o'clock in the morning and 4 o'clock in the afternoon. On Sunday the waste bins have to be washed so that they are left in good condition as the fair is over.

4.2.3. Restaurant: Personnel Area

The restaurant of the Farmari 2005 will be a tent located right outside the biggest of the exhibition halls. The waste collection point for the waste produced in the personnel area of the restaurant will be located outside the tent, with some of the waste bins in a maintenance hallway next to the restaurant tent. The compressors, however, do not fit the hallway and they have to be located further away from the tent. The aim is to put all the waste bins and compressors as close to the restaurant as possible.

Most of the waste produced in the personnel area of the restaurant is mixed waste. In practice this means mostly foil moulds, in which the food is transported from the kitchen to the restaurant and heated, as well as foil lids. Because the amount of food served in the restaurant is 16 000 servings during the event, the amount of foil moulds will be big. Foil is metal and is therefore not suitable to be burned with

other energy waste. An 8 m^3 container for the mixed waste will be located near the restaurant tent for the mixed waste produced in the restaurant. The container will be emptied on Friday and Saturday evenings.

Some plastic waste will be produced in the personnel area of the restaurant, consisting mostly of small plastic boxes in which salads and other food is brought to the kitchen. The bread served in the restaurant will be brought to the area wrapped in plastic wrappings and transported in reusable plastic boxes. These boxes will go straight back to the provider of the bread. All other plastic can be burned with the energy waste unless it is PVC. If the plastic is PVC it is marked with a number three (3). Small amounts of paper will be produced in the restaurant but it is mostly receipts from the cash registers and because the amount is small, the paper can be burned with the energy waste.

4.2.4. Restaurant: Customer Area

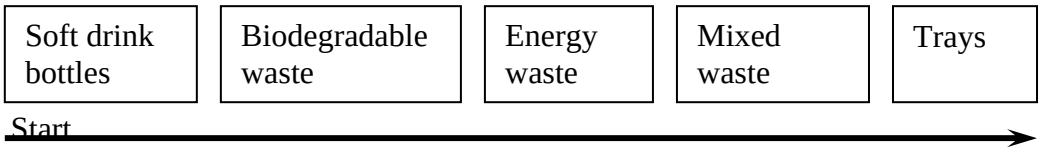
There are three doors to the restaurant which all will work as both entrances and exits. There are also seats for the customers in the closest exhibition hall. This means that four waste collection points are needed in the customer area. In all the waste collection points there will be 240 litre bins for energy waste, biodegradable waste and mixed waste. There will also be a case for the reusable soft drink bottles and a table for the trays. Because the amount of glass produced in the restaurant is small, glass will not be separated from the waste. Other types of waste should not be expected from the customer side of the restaurant.

The most of the waste expected from the customer side of the restaurant will be energy waste. This includes the cardboard mugs and plates, plastic knives, forks and spoons, juice jars and candy wrappings. Because the amount of energy waste is big, a compressor for the waste is located close to the restaurant. The waste bins have to be emptied several times a day into the compressor. The compressor will be emptied on Friday evening.

The biodegradable waste expected from the customer side will be food and napkins. The napkins could also be burned with the energy waste but according to the waste regulations all materials must first be recycled before the energy is taken from the material. This means that the napkins have to be composted with the biodegradable waste. It is also cheaper for the Farmari 2005 to have more biodegradable waste than energy waste.

Because the waste produced by the customers in the restaurant can be recycled a lot of mixed waste should not be produced. Ice cream papers are too damp to be burned with the energy waste so they will have to be put into mixed waste. There is metal in the lids of the 2-decilitre milk jars and butter pans, which means they cannot be burned with the energy waste.

The way the waste bins are arranged in the waste collection point can be seen in picture 1. The aim is to arrange the waste bins so that sorting the waste can be as easy as possible and the customers can move quickly through the waste collection point. First in the collection point will be a case for the soft drink bottles because the bottles are big and they fall over easily. The first waste bin will be energy waste because there is the greatest amount of energy waste produced. The next waste bin is for biodegradable waste. The third waste bin is for mixed waste. Last is a table for the trays, which will also be the cleaning point of the trays. In the collection point will be people guiding customers how to sort the waste.



Picture 1. The arrangement of the waste bins in the waste collection point of the customer side of the restaurant.

The energy waste bins will be emptied in the restaurant by taking the plastic bag from them and replacing it with a new one. This has to be done several times a day and at times the waste can also be compressed in the waste bin to make room for more waste. For the biodegradable waste several waste bins will be reserved in the

maintenance hallway of the restaurant. When one bin is full it will be taken out from the customer area and another one will be brought in. This is because the biodegradable waste is heavy and it would be difficult to change the biodegradable plastic bags. The waste bins will be emptied in the evening after the area has been closed to the customers. The mixed waste bins will be emptied as the energy waste bins several times a day. A container for mixed waste will be located outside the restaurant.

4.2.5. Cafeterias

There are four cafeterias in the Farmari 2005 area, each located outdoors quite far from the exhibition halls. One cafeteria will be located in the South end of the department of livestock and domestic animals, one on the South side of the machinery department, one in the forestry and wood energy department and one in the North end of the department of livestock and domestic animals. The cafeteria in the South side of the department of livestock and domestic animals will be Portaat Luomuun organic cafeteria.

Altogether about 35 000 portions of coffee will be served in the cafeterias and in the restaurant during the fair. All of the cafeterias will have an individual waste management. Energy waste, biodegradable waste and mixed waste can be expected from the cafeterias.

The energy waste includes cardboard mugs, plastic spoons and the cardboard from the coffee packages. The biodegradable waste includes napkins, teabags, possible food and coffee grounds. The mixed waste includes ice cream papers and foil from the coffee packages.

Even though there are a lot of recyclable materials, collecting and separating different waste types would be difficult. People will most likely buy their refreshments and continue walking around the fair area. Therefore only mixed waste will be collected from the customers. From the personnel side biodegradable

waste will also be collected because there will be a lot of coffee grounds. Several 240 litre waste bins for the mixed waste will be located near the cafeteria for customer use. These bins will be emptied several times a day to an 8 m^3 container, which will be located near the cafeteria. The bins for the biodegradable waste will be emptied in the evening with the biodegradable waste from the cafeteria.

The exception is the Portaat Luomuun organic cafeteria, which will have waste collection point similar to the ones located in the restaurant. This is because the nature of the cafeteria is environmentally friendly. One waste collection point will be located near the cafeteria. The waste collection point will include separate bins for energy waste, biodegradable waste and mixed waste. People guiding customers how to sort the waste will be near the collection point.

4.2.6. Grills

In the area of Farmari 2005 there will be three grills. Each grill is located together with the cafeterias. In the North end of the department for livestock and domestic animals there will not be a grill together with the cafeteria. Altogether 5000 servings of Scandinavian hash and 8000 sausages are served in the grills during the fair. The waste expected from the grills includes energy waste, mixed waste and biodegradable waste.

The energy waste includes only the plastic forks and the biodegradable waste only napkins, papers the sausages are served in and possible food. The mixed waste includes for example plates for the Scandinavian hash and ketchup and mustard bottles, which are too damp to be burned with the energy waste. Because the grills operate in the same premises with the cafeterias no separate waste management will be organised for the grills. This is why from the customer side only mixed waste will be collected.

4.3. Livestock

The estimated amount of livestock in the department of livestock and domestic animals is big. It includes 255 head of dairy breed cattle, 20 calves, 5 head of beef breed cattle, 4-6 pigs, 12 horses, 8 sheep and about 30 grazing and tended sheep. The waste produced in the department is biodegradable waste, mostly manure and litter. The exhibitioners might also produce cardboard boxes and other wrapping materials during the fair from the department. There is also some water-milk mixture produced by the milking kitchen.

Two demountable platforms for the biodegradable waste will be brought to the department of livestock and domestic animals. These platforms are emptied each evening to ensure the platforms are not full and to prevent the smell. The exhibitioners of the department are welcome to use the waste bins located next to the cafeterias as well as the compressors in the waste collection point. The water-milk mixture from the milking kitchen will be collected into a tank, which will be emptied every morning.

4.4. Exhibitioners

The waste produced by the exhibitioners will most likely be mostly cardboard and other wrapping materials. Especially the people selling candy will have a lot of empty cardboards. There will be a compressor for the cardboard in the waste collection point, behind Hall-B. A compressor for the mixed waste will also be located in the waste collection point. The exhibitioners are also encouraged to use the waste containers for mixed waste located near the cafeterias.

In case an exhibitioner produces hazardous waste the exhibitioner is responsible for taking the waste to proper waste handling facility. The hazardous waste can not be taken to the waste management points of Farmari 2005. Organising waste management for possible hazardous waste would be difficult because there is no

way to predict what types of hazardous waste will the exhibitioners produce.

4.5. Toilets

Tampere Exhibition Centre Pirkkahalli has toilet facilities for 10 000 people per day. Because the expected amount of visitors is 90 000 people during four days toilet facilities have to be brought to the area for 10 000 – 15 000 people. This means 80 portable toilets and 6 portable toilets for the people using wheelchairs. Five of the toilets will be located on the parking areas.

The toilets will be located around the area so that all of the toilets are outside and not very near the entrances of the exhibition halls. The toilets will be located in groups of at least six toilets. This is expected to reduce the queues, which makes using the toilets easier and nicer. Especially families with small children have been taken into consideration when planning the locations of the portable toilets.

The portable toilets will be emptied and washed each morning to make sure they are not full and to prevent the smell. Chemicals to prevent the smell will be added to the toilets after they are washed. During the day it is important that the cleaning personnel will check the toilets to make sure there is toilet paper at all times. If a toilet is extremely dirty or full the personnel will turn the toilet so that it is not accessible. The cleaning company responsible for cleaning the exhibition halls will take care of the cleanliness of the toilets inside the halls.

4.6. Parking areas

There will be altogether five parking areas located relatively close the Farmari 2005 fair. There will be busses going between the parking areas and the fair area. To each of the parking areas 240 litre waste bins will be brought for mixed waste. Portable toilets will be brought to the parking areas. The toilets will be emptied and

washed as the toilets in the fair area. The emptying of the waste bins will be taken care by the group maintaining the parking areas. A map showing the locations of the parking areas can be found from the appendix Jätehuoltosuunnitelma.

4.7. Construction and Demolition

4.7.1. Construction

The first measurements in the Farmari 2005 area will begin on Thursday 14th of July and Friday 15th of July. However, the waste management will not begin before Monday 18th of July because the construction of the outdoor areas will not properly begin until that day.

Two demountable platforms will be brought to the area for the waste produced during the building of the fair. When planning the locations of the platforms, it is important to make sure the platforms can be taken away from the area after the building is done. One of the platforms will be located near the main entrance of the fair area, on the South side of the halls. The other platform will be located on the North side of the halls, between Hall-A and the department of livestock and domestic animals. The waste containers and compressors of the Exhibition Centre Pirkkahalli will also be in use during the building.

The demountable platforms will be emptied during the building as often as needed. The containers and compressors of the Exhibition Centre Pirkkahalli will also be emptied when needed. The people building the fair and the exhibitioners are responsible for taking the waste they produce to the waste containers and compressors even though during Tuesday 26th of July and Wednesday 27th of July waste management personnel will be checking the area.

4.7.2. Demolition

The demolition of Farmari 2005 will begin on Sunday 31st of July after the area has been closed from the public. Most of the demolition will take place during Monday 1st of August and Tuesday 2nd of August. The exhibitioners have to leave the area on Tuesday 2nd of August by four o'clock. The final check of the area will be done on Wednesday 3rd of August at five o'clock.

For the waste produced during the demolition of the fair seven demountable platforms will be brought to the area. The locations of the platforms will be determined as they are brought to the area. The waste containers, which are brought to the area before the fair starts, can also be used for waste produced during the demolition. The platforms and other waste containers will be taken away from the area in the morning on Wednesday 3rd of August.

5. CONCLUSIONS

The planning of the waste management of Farmari 2005 Agricultural Fair of Finland already began during autumn 2004. It can be said that the planning began early enough and most of the areas of the waste management were taken into consideration from the beginning. However, as it was impossible to predict how much waste and what waste types would be produced, some areas of the waste management might have been left out from the plan.

The biggest problem when making the waste management plan was getting the information from all the people involved in organising the event. Especially since the people planning how much food will be served lived in a different city than the rest of the people planning the event, the information did not always reach all the people. This is why the restaurant and the cafeterias were the most difficult areas to plan the waste management for.

Another difficult thing was to estimate the amount of waste produced during the event. One reason for this was that the number of the exhibitioners was not confirmed until the beginning of the event. The estimation of the waste produced was also difficult because it was expected that many of the exhibitioners would hand out leaflets or candy. It was impossible to know how many leaflets would be handed out during the event. It was also difficult to predict how many visitors there would be during the event even though the target was 900 000 visitors.

Having the meetings with people who had some experience in waste management was extremely helpful for the planning. Checking the plan with the waste management company responsible for renting the waste containers and emptying them helped to make the plan as realistic as possible. Also having a lot of people reading the plan through over and over again helped to notice the things, which were unclear or actually missing from the waste management plan.

It can be concluded that because there was enough time to do the planning and quite a few people with knowledge of the issues related to the waste management read the plan it is most likely the plan will work in practice too. It is also good to remember that a waste management plan for such a big event will always be a little different from what will be done. This is because during the event there might come up a need for example for a waste container in a place where it was not planned. This is why the waste management plan gives only the guidelines for the waste management during the event.

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The appendices can be found only from the printed version of this thesis, which is located in the Tampere Polytechnic Library.