LIFE Project Number

LIFE02 ENV/FIN/000329

TECHNICAL INTERIM REPORT

Reporting Date

28.02.2003

LIFE PROJECT NAME

Environmentally Friendly Systems to Renovate Secondary Roads. A demonstration project in Luopioinen, Finland

Data Project

Project location	Luopioinen, Pirkanmaa Region, Finland
Project start date:	01.12.2001
Project end date:	31.12.2004
Total Project duration (in months)	37 months
Total budget	1 253 630 €
EC contribution:	626 815 €
(%) of total costs	50
(%) of elibible costs	50

Data Beneficiary

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List of Contents

1. EXECUTIVE SUMMARY

The project, Kukkia Circlet, aims at demonstrating new, innovative and sustainable methods to recycle industrial waste important in volume in the renovation and maintenance of the secondary road network and the rural infrastructure. Finnish Road Enterprise is the beneficiary of the project that is co-financed by EU Life-Environment by 50 % of the project's eligible costs. The project partnership involves Luopioinen municipality, Georgia-Pacific Finland Oy, Finncao Oy, Kemira Chemicals Oy, and the Council of Tampere Region. Also the Finnish Road Administration is involved in the project as its major co-financier.

During the Life-Environmental project, the technologies and processes of the methods will be tested in Luopioinen, Finland, but the methodology is applicable and beneficiary for other European countries as well. Wide exploitation of the project results will help in the protection of non-renewable natural resources, in the reduction of high volumes of waste, and in the reduction of need for waste deposits in Europe.

The Interim Report of the project will firstly take a general look at the project's background, objectives, technical solutions and results. Secondly , the report will give the Life-project framework with a description of the project phases or tasks and their connection to each other, and with the description of the project's partnership and organisation. Thirdly, the report describes the applied methods, technology and processes task by task, but concentrating on the methods of the tasks and activities that have been carried out or are in progress. Fourthly, the technical progress and results until the end of February 2003 have been described. Fifth, the dissemination activities will be described. So far, there are no deliverables of the dissemination task, though the progress has been largely like planned. Sixth, there is the short evaluation of the project at this interim stage. There are only a few aspects taken like the project and its management, the process and technology as well as economic outcome of the Pilot 2002 at its first stage, the dissemination activities and the job creation opportunities during the project itself. Seventh part gives the planned project progress until the end of the project. Finally, there is the summarised cost report of the project, based on the consolidated interim cost statement of the project.

The project's progress has been mainly like planned with respect to the activities and their results as well as to the costs. There have been delays in some of the activities, but these delays have not caused any problems or harms to the other activities or tasks of the project. The plans for the project have been checked and they indicate, that the project will be carried out and finished successfully.

2. INTRODUCTION

The background of the project is the common concern over the high volumes of industrial waste being idle deposited in disposal sites, and the condition of the road network in the rural regions. Previous research and testing have shown, that high volumes of industrial waste could be increased in value and used as raw material for construction purposes. On the other hand, the secondary road networks involve problems based on the availability of proper aggregates, the soil and/or climatic conditions, conventional structures, materials and methods of renovation and maintenance, and economical restrictions imposed on the road administration and municipalities.

In general, the secondary roads in Finland are of inferior quality, suffering from repeating frost damage of the conventional structural road courses, and relatively dangerous for the local light traffic. Each year the conventional renovation and damage repair involve at least consumption of high quantities of virgin stone aggregates, removal and disposal of large volumes of old, low-quality aggregates from the road courses, and a lot of long-distance heavy transports and, consequently, high energy consumption. These processes are expensive and environmentally harmful, but their effect on the road quality will be of short-term duration. Because of high expenses, the possibilities of rural infrastructure development and improvement, like adding of the light traffic paths to the sides of the rural roads, are slim.

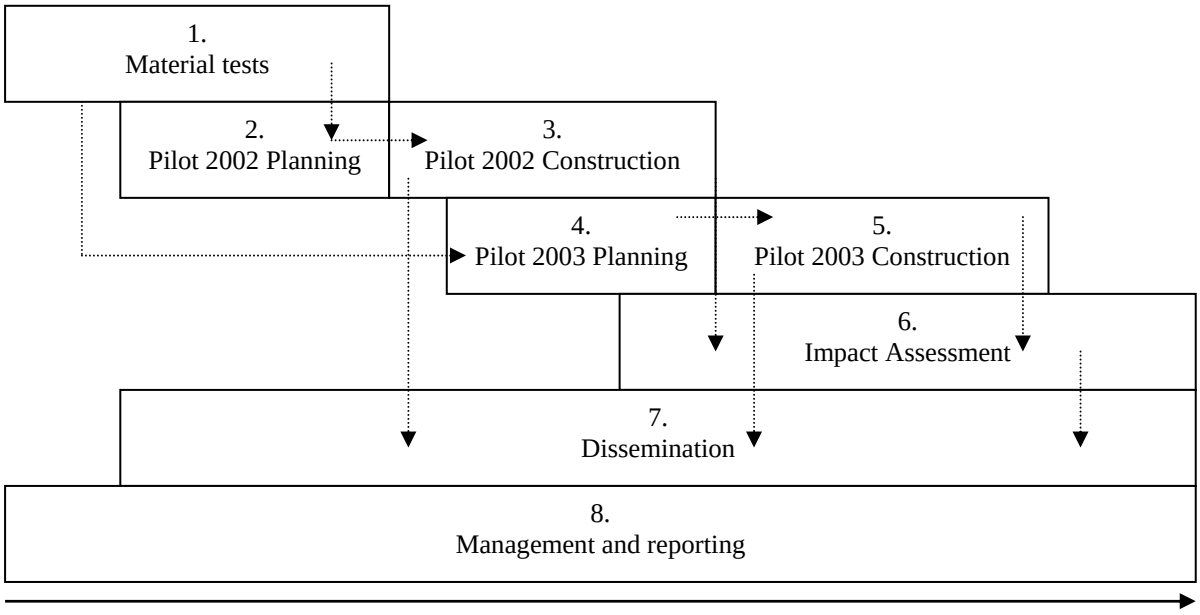
The Life-Environment financed project, Kukkia Circlet, aims at demonstrating new methods to solve these problems. The project will show ways to use industrial waste materials to improve and develop the rural infrastructure despite scarce financing resources, and this will make it possible to save significant amounts of non-renewable natural resources and beautiful nature for the future generations. The methods will be based on the recycling of the high-volume waste streams from the industry and the existing structural aggregates of the roads.

The project will focus on the recycling of the most potential and interesting types of waste or “idle by-products” from the paper and chemical industry, the fly ashes, fibre sludge and filter cake, that represent the behaviour of various types of industrial waste in Europe. These materials will be used to test processes of stabilisation and construction of structural courses of existing and badly damaged gravel roads, construction of a groundwater protection structure, and construction of new types of light traffic paths. The project is composed of two pilots. Pilot 2002 started in 2002 and involves renovation of a secondary gravel road in Luopioinen by stabilising the existing road courses with help of stabilisers based on industrial by-products. Pilot 2003 will involve construction of different types of light traffic paths and another renovation system by using mixtures of fibre sludge with fly ash as structural course materials. Pilot 2003 also involves testing of a groundwater protection structure based on a water permeable sealing course of fibre sludge.

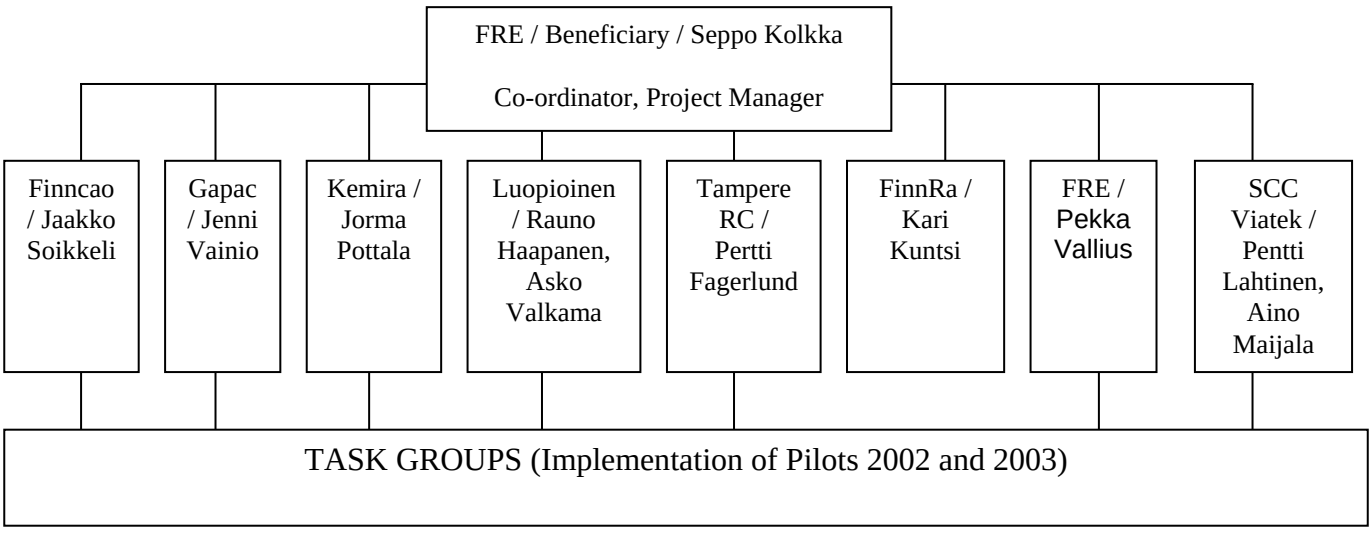
During the Life-Environmental project, the new technologies and processes will be tested in Luopioinen, Finland, but the system is applicable and beneficiary for other European countries as well. Wide exploitation of the project results will help in the protection of non-renewable natural resources, in the reduction of waste volume and need for waste deposits in Europe.

3. LIFE-PROJECT FRAMEWORK

The project will be carried out according to following schema, showing the tasks and their rough connection to each other:



The co-ordinator and project manager, Mr Seppo Kolkka, has been carrying out the overall responsibility for the project management. Small task groups with persons from FRE, Luopioinen and expert organisations have been carrying out the implementation of the planning and implementation of the Pilots and the required tests on materials. The task group meetings have been held when necessary (in average once a month). The industrial partners have taken care of the by-product materials: Finncao of fly ash, Kemira of filtercake and Gapac of fibre sludge. Tampere RC participates in the activities of dissemination. FinnRa has taken to control the project with respect to its role as a major co-financier, in addition to the Commission. The Steering Group, consisting of members of the beneficiary, co-financing and partner organisations as well as the main experts for the project, has assisted with the project management and with the carrying out of the scheduled tasks. The project organisation can be described with the following organogram:



4. TECHNOLOGY

Applied methodology and technology will be described for those Tasks and activities performed so far (until 28th February 2003). The description involves following tasks: Material tests, Planning of Pilot 2002, Pilot 2002 Construction, Planning of Pilot 2003 and Impact Assessment.

41 Material tests

Material tests involve basic geotechnical tests on the material components and tests for the strength development and long-term performance on the mixtures in order to determine the optimum admixtures for stabilisation of Pilot 2002 and the optimum mixtures for the different structural applications of Pilot 2003. Additionally, the structural material for groundwater protection (Pilot 2003) will be tested for water permeability. Also, there will be environmental tests for Pilot 2003 because of the relatively high volume of by-product materials used for the structural applications.

The basic geotechnical tests comprise the determination of water content, loss of ignition (LoI), grain size distribution and compactibility. The strength development of the material mixtures will be determined with 1-axial compression test (unconfined compression strength test, UCS). The long-term performance will be forecasted with relatively strenuous freezing-thawing and frost susceptibility tests. The water permeability will be determined with a soft wall permeability test. The environmental tests involve the determination of the total content and leaching of the most critical inorganic elements from a most risky mixture of fly-ash and fibre sludge. Short descriptions of the tests will be given in Annex 2 of this report.

42 Planning of Pilots 2002 and 2003

The planning phase is meant to prepare for the actual implementation and testing of the processes (Pilot construction) and involves soil investigations, determination of the processes and engineering of the structures of the pilots to be implemented, applications for environmental permits with respect to the Finnish environmental legislation, and making appropriate orders for materials, equipment and other resources.

Soil investigations will be in order to determine the condition of the site before renovation and to assess the need for preparatory work before actual construction. These investigations involve visual assessment of the site and its environment, drilling of vertical samples from the road, digging of test pits for visual assessment and sampling, and ground radar investigations that give continuous and completing data and information on the soil properties at different depths under the surface.

Planning of Pilots have involved a lot of desk work and meetings. There is also computer aided Auto-Cad designing of the structural applications, and will be programmed dimensioning of the light traffic path structures for Pilot 2003.

Luopioinen municipality has given a closed disposal site for the storage and mixing of the materials, both by-products and eventual commercial additives. FinnRa has the ownership and responsibility for the renovation and maintenance of the actual

road sites, as well as for sites to test the light traffic structures. The need for by-products or industrial waste for Pilot 2002 was totally less than 5000 tonnes; therefore the environmental permit was given by the environmental authorities of Luopioinen municipality, though under the control of the Pirkanmaa environment centre. The need for by-products for Pilot 2003 will be close to 10000 tonnes, and the permitting authority is the Pirkanmaa environment centre.

43 Pilot 2002 Construction

Pilot 2002 construction methodology and technology has been described in more detail in the Annex 1 of this report (Report on Technical Progress 1.12.2001-31.12.2002).

Pilot 2002 is testing the effect using industrial by-products as binders for the stabilisation of existing gravel road courses in comparison with the conventional renovation and maintenance methods. The pilot involves also testing of new types of covering courses on the gravel roads based on the crushed aggregates mixed with filtercake which is being generated during the manufacturing of salts to prevent the gravel roads from dusting.

Before the construction process could start, the ditches of the existing road had to be dug again, and the road surface had to be harrowed in order to remove the biggest stones emerging on the surface, Figure 1. Also reference samples for environmental tests have to be taken.

Cement and FTC were supplied dry and in water tight containers to the storage area. The industrial by-products were transported in lorries and stored in piles until they were mixed with a new station mixer of the Finnish Road Enterprise, Figure 2. The binder admixture was transported to the construction site after mixing, in adequate batches in an open lorry synchronously with the construction process.

The stabilisation process moved forward as follows: The surface of the road was watered and certain road sections were harrowed again (see above). The binder admixture was spread with an asphalt spreader and mixed evenly into (in average) 200 mm of the old road course with a stabilising milling machine, Figure 3. After this, the surface was compacted and levelled with roller machine. The covering course (100 mm) was spread on the surface after a few weeks of the smoothing of the traffic. In order to have the road open for the local traffic, the process moved on at one side of the road at a time.

Figure 1: Harrowing stones from the road

Figure 2: The mixing station

Figure 3: Stabilisation in progress: a milling machine at work

44 Impact Assessment

The impact assessment of the project is one of the most important phases and will involve assessment on the technical, environmental and economical aspects of the new process and methodology in comparison with the conventional ones. In order to have data for the assessment, the project involves follow-up sampling and testing at the Pilot applications: before implementation, during implementation and 2-3 years after implementation. The follow-up programmes have been given in Annex 1. The follow up involves visual control of the applications (including video filming), measurements of bearing capacity and tests on the strength development, and appropriate environmental sampling and analysis of water and soil samples.

5. PROGRESS, RESULTS

The technical progress of the project is described in Annex 1 as well and in more detail.

51 Material Tests

The material tests started in December 2001 and were finished for Pilot 2002 in July 2002. For Pilot 2003 the material tests were partly made during the spring 2002, but restarted after the Pilot 2003 Planning allowed to make the revised programme to conclude the tests in November 2002. Thus, the material tests lag a little with respect to the planned output.

The by-products were delivered as homogenised samples from UPM-Kymmene Ltd in Jämsänjokilaakso, the mills of Jämsänkoski and Kaipola (fly ash), from Helsinki Energy power plant (fly gas desulphurisation residue), from Georgia-Pacific Finland Oy in Nokia, and from Kemira Chemicals Ltd in Kokkola (filtercake). Also commercial mixtures like cement and FTC were used in the binder admixtures. FTC is a product of Nordkalk Ltd, and also it origins from industrial by-products: it is composed of Finnstabi®[1], fine lime and cement in proportion of 1:1:1.

The tests for Pilot 2002 materials (stabilisation of crushed stone aggregates with by-product admixtures) were made in order to compose the best recipes for admixtures. The tests were performed in the laboratory of SCC Viatek Ltd in Luopioinen according to the plan for material tests. Figure 4 gives the final results of all those admixture recipes that were chosen to be used in the stabilisation: after stabilisation at ambient temperature for 28 days and after a freezing-thawing tests.

The materials for Pilot 2003 involve structural course materials as follows: a mixture of fly ash and fibre sludge for the renovation of a road section and for the new types of light traffic path applications. Different mixtures of the component materials and other admixtures have been tested in the laboratory of SCC Viatek Ltd during the year 2002. The final tests for the recipe will continue until the beginning of April in 2003; the tests will involve two alternative mixtures SJ:LT 10:7 + FTC 6 % and SJ:LT 10:10 + FTC 6 %. FTC is a commercial binder admixture of Nordkalk. This admixture includes also by-product components from TiO_2 and limestone production. The tests on material mixtures involve tests for compression strength, freezing-thawing and frost susceptibility. For Pilot 2003 also the appropriate environmental tests will be carried out on a mixture of 'worst scenario', i.e. with the largest share of fly ash during 2003. The decision on the required environmental tests were made on the basis of available earlier test results and the environmental permit allowances.

The groundwater protection application of Pilot 2003 will require only fibre sludge for the impermeable course. The fibre sludge chosen for this purpose has to be the most homogeneous type available, for example the quality class U1 of Georgia-

[1] Finnstabi is based on a by-product from TiO_2-production

Pacific Finland Oy. This U1 is based on the deinking of high quality paper waste collected from the offices (other types are U2, based on the deinking of newspaper waste and U3, based on miscellaneous household waste paper). The material tests for the fibre sludge will be made in 2003 in order to determine its durability and impermeability. The tests involve permeability and freezing-thawing tests.

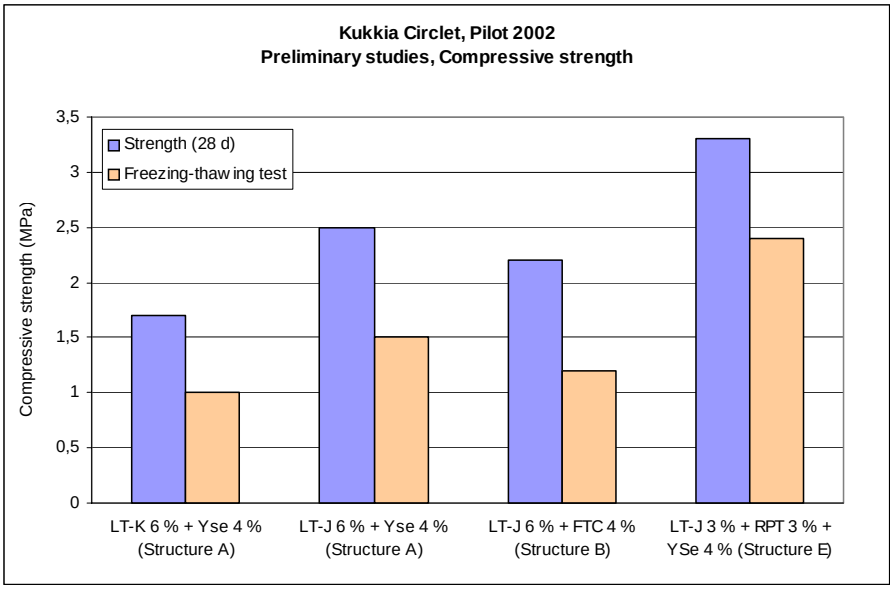
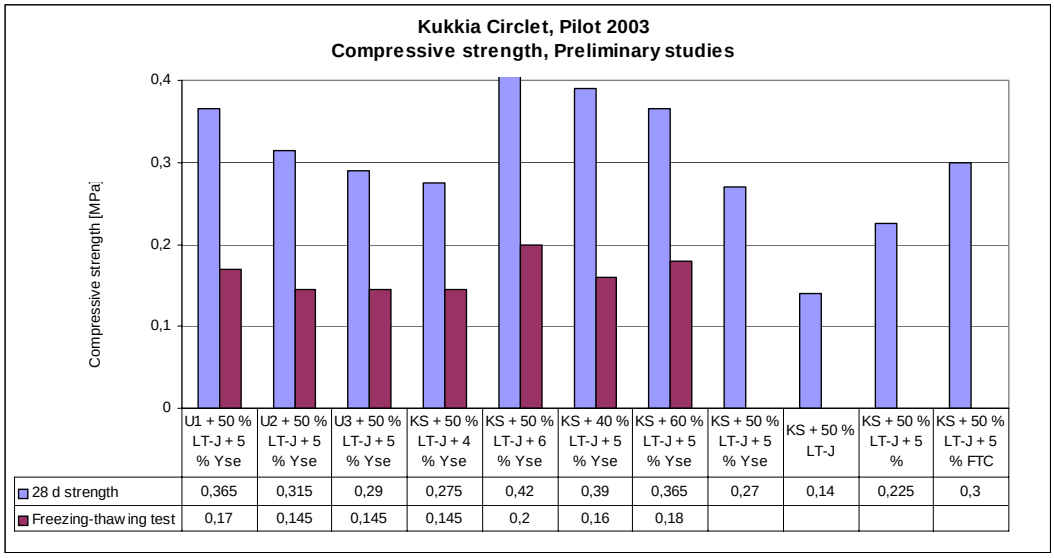


Figure 4. The compression strengths of the crushed material stabilised with different binder admixtures for stabilisation. (LT-K = Kaipola fly ash, LT-J = Jämsänkoski fly ash, Yse = cement, FTC = Finnstabi® mixture of the Nordkalk Ltd, RPT = fly gas desulphurisation residue).



	U1 + 50 % LT-J + 5 % Yse	U2 + 50 % LT-J + 5 % Yse	U3 + 50 % LT-J + 5 % Yse	KS + 50 % LT-J + 4 % Yse	KS + 50 % LT-J + 6 % Yse	KS + 40 % LT-J + 5 % Yse	KS + 60 % LT-J + 5 % Yse	KS + 50 % LT-J + 5 % Yse	KS + 50 % LT-J	KS + 50 % LT-J + 5 %	KS + 50 % LT-J + 5 % FTC
28 d strength	0,365	0,315	0,29	0,275	0,42	0,39	0,365	0,27	0,14	0,225	0,3
Freezing-thaw ing test	0,17	0,145	0,145	0,145	0,2	0,16	0,18				

Figure 5. Compression strength and freezing-thawing test of several mixes of fly-ash (LT) and fibre sludge (U1…U3) , KS) and additives (YSe = cement, FTC = Finnstabi mixture). A group of preliminary tests.

52 Pilot 2002 Planning

The task proceeded according to plans and was finished at the beginning of August 2002. Pilot site was determined already in December 2001, and the soil investigations with georadar (ground radar) could be carried out in March 2002. After this it was possible to determine the pilot programme: to make the preliminary choices of pilot sections and reference sections (the sections for conventional methods), make cross sections drafts of the applications, assess the need for by-product materials (fly-ash and filtercake) and apply for the environmental permit. The application for the environmental permit was submitted a little late, at the beginning of May 2002, but the environmental permit was obtained on time, in July 2002. After the receipt of the environmental permit, the final decisions concerning the pilot process and sections were made, and the availability of materials and machinery etc. on time was ascertained. Annex 1 describes the whole Pilot 2002 road site with its different sections on pages 4-6 and in its annex (a map of the Pilot 2002). In regard to the environmental permit allowances, it was necessary to have only the conventional reference sections on areas close to the Kukkia lake (its Natura 2000 area). The task was completed at the beginning of August 2002. The task was carried out in co-operation of FRE, Luopioinen and SCC Viatek Ltd.

53 Pilot 2002 Construction

The task started in June 2002 and was mainly finished in November 2003, though the Interim Report including the technical report of progress 2002 was put off to the end of March 2003. This major delay to finish the task has no effect on the progress of the project's other tasks and activities. The task was mainly carried out by FRE, with external assistance of SCC Viatek Ltd for the quality control, follow-up sampling and tests, of subcontractors to carry out certain parts of the stabilisation process and transports (tests concerning spreading, milling and compaction), and of the industrial partners providing for by-products for the Pilot.

Preparing of the site and the implementation included the practical arrangement for the storage and mixing of materials, and the preparatory works at the road. Before the construction process could start, the ditches of the existing road had to be dug again, and the road surface had to be harrowed.

The storage and mixing of the material masses took place at a closed disposal site of the municipality of Luopioinen (the site called Rankkimäki). Cement and FTC were supplied dry and in water tight containers to Rankkimäki, and the industrial by-products were supplied 'wet', from the industrial deposits. The industrial by-products were stored in piles until they were mixed with a new station mixer. The binder admixture was transported to the construction site after mixing, in adequate batches in an open lorry synchronously with the construction process. It is important that the admixtures are being spread, mixed into the road course and compacted during the same day. Otherwise the reactivity of the admixtures will suffer significantly.

In May-June 2002, well before the start of any stabilisation process, the reference samples were taken for the environmental tests. Water samples from the wells of houses close to the road were taken by an accredited person of the municipal

healthcare organisation, and the water samples from drainage ditches and the soil samples from the road sides by the personnel of SCC Viatek Ltd, SGT. The samples were analysed in an accredited laboratory (Chemical laboratory of Geological Survey of Finland or GTK) in Espoo, to determine the heavy metal contents with ICP-MS/AES. The results will be compared with the results from the follow-up samples taken each year at same or corresponding sites. The first results will be available in the autumn 2003.

The actual pilot construction started as planned on 19th August 2002. The order of the different sections was as follows: at first the new stabilisation structures and finally the reference structures. The stabilisation process moved forward like described in chapter 4 – and the stabilisation was finished mid September. The whole process of Pilot 2002 construction was finished with the covering courses at the end of September 2002. The local inhabitants of the municipality were thankful for the renovation process and celebrated it as an "opening of a new road" on 25th September 2002. The results of the test have been very promising, like indicated later in Chapter 7(Evaluation and Conclusion).

54 Pilot 2003 Planning

The task started at the beginning of August 2002 by a task group meeting. FRE has again the main responsibility for the task, but assisted by persons of FinnRa, Luopioinen and the external assistance SCC Viatek Ltd, SGT.

The sites for the different applications have been chosen, soil investigations have been carried out and the environmental permit applications for material storage and for Pilot 2003 construction have been submitted. The plans have been proceeding so far, that the orders for by-product materials have been submitted: the materials will be delivered during May-July/August 2003, according to the planned progress of testing.

A section of Pihtisalmentie (Pt 13981, Auraanpohja road section) in Luopioinen will be renovated by compensating for 500 meters of a existing, badly damaged road course with a fibre-ash structural course. Fibre-ash is a given name for a mixture of fly ash with fibre sludge. The groundwater protection structure, with a 500 mm thick sealing course of compacted fibre sludge, will run along the edge of Pihtisalmentie for about 20-30 meters with a width of 5 meters from the edge of the road over the ditch and into the other side of the road.

The major problems of the planning are the pilot programme or the plans for the applications for the light traffic paths. The test applications will be sited at the sides of the local road MT 322, and there will be three types of applications: 1) a floating structure on a soft soil site, a wetland area – as soon as the light traffic path is available, the inhabitants have planned to have make the surrounding area as a recreational area with bird life follow-up and conservation activities; 2) a structure on an firm embankment close to the village centre, and 3) an one meter's extension of the sides of the local road. The extension is the cause of problems because of cables in the embankment and the difficulties to separate the light traffic path from the driveway. The separation of the light traffic path must be visible and useful also during the winter, and should withstand but not prevent the working of snow-ploughs.

More detailed description of the plans are given in the Annex 1 (p. 13-20). There are also preliminary plans for the machinery and other equipment as well as the process for different applications, but some are open with respect to the plans for the light traffic paths. Also the environmental permit allowances might change some parts of the plans.

55 Pilot 2003 Construction

The task is planned to start at the beginning in May 2003 by taking the reference samples for environmental testing. The preparation of the sites for light traffic traffic paths have started already, and the availability of the by-product materials have been confirmed.

The task will be mainly carried out by FRE, with external assistance of SCC Viatek Ltd for a part of the quality control, follow-up sampling and tests, of subcontractors to carry out certain parts of the process, including mixing of materials and transports, and of the Luopioinen and industrial partners providing for by-products for the Pilot 2003.

56 Impact Assessment

FRE will have the main responsibility of the task, and will be assisted by external experts, like SCC Viatek Ltd, SGT.

Pilot 2002 is ready for the follow-up. Geotechnical instruments have not been installed at the stabilised road sections for the follow-up, but the follow-up will be made with geotechnical and environmental in-situ tests, by sampling and laboratory tests. In 2002 the follow-up included the tests before and during the pilot 2002 construction process, according to the follow-up plan (see Table 2 of Annex 1). The visual follow-up during the autumn 2002 did not show any damage or changes in the road.

Also for the Pilot 2003 it has been decided not to invest on geotechnical instruments, as those are more appropriate for R&D field tests. The plans for Pilot 2003 follow-up are given in Table 4 of Annex 1.

6. DISSEMINATION ACTIVITIES AND DELIVERABLES

FRE has the main responsibility for the performance of the task but shared with the other project partners, again. The progress has been as follows:

Partners and the external assistant SCC Viatek Ltd have started the creation of the **Contact Network** in Europe in July 2002, and this has been in progress since then. Initial Contact Network was available in September 2002, but there all the time emerge new network members in connection of other issues, projects and happenings. The Contact Network of each partner will be put together as a list of organisations and contact persons for the mailing list of the **workshop** in the Autumn 2003.

Video-filming started in June 2002 during the preparation of the site for Pilot 2002. Video-filming has been continuing since then on every occasion in connection of the project's technical progress. The edited videos will be given as a part of the Guide material for the dissemination. The video-filming and editing have been given to an external expert, an unemployed student and person excelled in this field.

WWW-pages were opened in September 2002, and developing since then. They contain internal pages for the Steering Group (mainly memoranda of the meetings), but also information of all happenings as well as publications and reports of the project that are available to all interested parties. The www-pages will be maintained by SCC Viatek Ltd during the project, but accessible through the www-pages of FRE as well. The direct address is http://www.viatek.fi/sgt/life/.

LEAFLET as a presentation of the project was prepared and spread to the partners and to the Contact Network as well as included as the project description page in the www-pages. The Leaflet was finalised in August 2002.

GUIDE has not been started though it will be composed of the technical reports and other experience obtained during the project.

OTHER: In addition to the former activities, there have been two opportunities to present the project in a workshop or conference . The first one was in USTRON, in Poland on 8th-11th October 2002. At the 9th International Conference "Ashes from Power Generation" Pentti Lahtinen (SCC Viatek Ltd) presented a paper about the project. The second one was a workshop arranged by FRE, SCC Viatek and the industry on "Industrial By-products in Infrastructures" in Tampere on 7th November 2002. Amongst the 110 participants there were around 10 participants from other countries to listen to the presentation of Pentti Lahtinen about the Recycling of industrial by-products in Finland, Kukkia Circlet being one of the major examples.

7. EVALUATION AND CONCLUSIONS

At this stage of the project the evaluation can be directed only on a few aspects as follows:

71 Project and its management

The project is very demanding and not in the least because it is not a normal and conventional method to operate. A part of exacting requirements is based on the strategic importance of the project's results to the participants and financiers and, thus, on the acknowledged responsibility to make it successful.

The management of a consortium with different types of partners and co-ordination of the project is not as complicated and problematic as was expected due to the clear budgets and plans, division of responsibilities, and the consortium agreement.

72 Process and technology, Pilot 2002

At this stage of the project it is too early to evaluate or make conclusions on the project results, though the first impressions of the Pilot 2002 operations indicate, that the stabilisation methods is very competitive with the conventional renovation and maintenance methods.

In general, the whole process and the transportation logistics of pilot 2002 worked effectively, but have to be improved in relation to

- the vulnerability of the process as the breakage of one machine may interrupt the process and take long to repair
- the dusting during mixing, transports and construction; there is need for watering systems in connection of the other equipment and/or encased feeding equipment for dry admixtures

The economical follow-up of the construction has shown that the total cost for a 9339 meters stabilised section was roughly 411 000 € or 44 026 €/km . The total costs of the conventional 2850 meters' reference sections was 80 400 € , or 52 456 €/km for the "pot-hole renovation" section and 4800 €/km for the simple and ineffective "autumn renovation" section. The actual stabilisation took two weeks, and the effective work progress was on average 2 kilometres of stabilised and renovation road each working day.

The former figures give only the figures for the renovation or maintenance activities but do not show the long-term benefits of the new systems. For conventional renovation or maintenance, there is need for maintenance activities at least every other year. In case there is no need for maintenance of the stabilised sections during the project period, until the end of 2004, the new process is successful and the objectives have been met. The very dry summer and autumn of 2002 and, consequently, the very low levels of ground water have caused deep frost which may cause serious damage to the infrastructure. Therefore, the first spring of the

stabilised road sections is not at all close to a normal spring and will be a very strenuous one.

73 Dissemination activities

The dissemination activities have been carried out like planned, but the emphasis of dissemination will be in the year 2004, after both of Pilots have been implemented and the follow-up has given the first indicative results. All activities so far have been preparing activities, and main deliverables will be ready in 2004.

74 Job creation – during the project

During the project the partners have been glad to notice, that the project itself creates training jobs for students and young unemployed professionals, both during the implementation processes of Pilots 2002 and 2003 and for the dissemination task. The partners have hired young trainees or professionals for jobs like quality control, testing and sampling activities during the stabilisation in 2002 and for the video filming for dissemination. This system will continue during the other phases of the project.

8. PLANNED PROJECT PROGRESS

The planned project progress from 1.3.2003 to 31.12.2004 will include following activities and reports

Material Tests (Task 1) will be finished latest in May 2002 with the results of the environmental tests. The report on the final material tests for Pilot 2003 will be included in the Progress Report in the autumn 2003 (30.9.2003).

Pilot 2003 planning (Task 4) will be finished at the end of July 2003. The environmental permits will be obtained during the summer though allowance for implementation will make it possible to start Task 5 before the official permit. The deliverables will include the final technical designs of the structural applications of Pilot 2003, and the instructions for constructions, quality control and follow-up (a work document). The deliverables will be included in the Progress Report in the autumn 2003 (30.9.2003).

Pilot 2003 construction (Task 5) has already started with some of the preparatory works, but the reference sampling will be made in May 2003 and the actual process tests will start in June 2003. The process tests will be finished In August-September 2003, like planned. The report on the pilot 2003 construction will the included in the Progress Report of 30.9.2003 as the deliverable of the task.

Impact Assessment (Task 6) will continue according to the follow-up programmes for Pilot 2002 and Pilot 2003. As deliverable, an interim impact assessment report will be drawn up during the autumn 2003 and included in the Progress Report in the spring 2004 (31.3.2004). A draft of the final Impact Assessment, including technical, environmental and economic aspects will be submitted in May 2004 for the evaluation of external evaluators, and published in the workshop in the summer 2004. The report will also be included in the last Progress Report of September 2004, with eventual reports and statements of the external evaluators. The final Impact Assessment will be included in the Final Report of the project, and published in the project's www-pages.

Dissemination (Task 7) will continue as follows: The video filming will continue and the editing of the video presentations will start at the end of 2003. The draft edition will be presented in the workshop of the summer 2004. The finished edition of the video presentation will be ready in December 2004. The outline of the contents for the Guide will be drafted and the compilation of the Guide will start latest in September 2004. The draft edition of the Guide will be presented in the workshop of the summer 2004. The finished Guide will be ready in December 2004 and available in the www-pages for the target groups. The Contact Networks of the partners will be put together as a list of organisations, contact persons and contact information latest in September 2003. The preparations for the workshop in June 2004 will start in the autumn 2003. The presentation of the workshop and call for eventual additional papers will be submitted to the Contact Network. The workshop will be held in Tampere in June 2004. In addition to the former activities, the participants have agreed that the project will be on display in appropriate conferences, as paper presentations and/or as posters, during and after the project period. The next opportunity will be Wascon 2003 of Iscowa in San Sebastian, in

Spain on 4th- 6th June 2003, where the project will be displayed as poster. Other plans have not been specified, yet.

Management (Task 8) will continue with the co-ordination and management of the project like so far. In 2002 there were three (3) Steering Group meetings, and there will be two meetings both in 2003 and in 2004. There will be 2 Progress Reports each year, though the first Progress Report of 2003 is this Interim Report. The Final Report will be submitted according to the contract with the Commission, at the beginning of 2005.

The following table summarises the implementation plan:

LIFE02 ENV/FIN/329		Kukkia Circlet															
Tasks		2001				2002				2003				2004			
		1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T
Overall schedule	Base				**S**			**X**	**In**		**X**		**X**		**X**		**X**
	Actual				S			X		In	**X**						
1. Material tests	Base				XX	XX	XX	XX									
	Actual				XX	XX	XX	XX	XX	XX	xx						
2. Pilot 2002 Planning	Base				XX	XX	XX	X									
	Actual				XX	XX	XX	X									
3. Pilot 2002 Construction	Base						X	XX	X								
	Actual						X	XX	XX	XX							
4. Pilot 2003 Planning	Base							X	XX	XX	XX	XX					
	Actual							X	XX	XX	xx	xx					
5. Pilot 2003 Construction	Base										X	XX					
	Actual										x	xx					
6. Impact Assessment	Base								XX	XX	XX	XX	XX	XX	XX	XX	XX
	Actual								XX	XX	xx	xx	xx	xx	xx	xx	xx
7. Dissemination	Base							XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
	Actual							xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Start = S; Progress Report = X; Interim Report = **X;** Interim period = In;
Planned / Actual progress: XX ; Predicted progress: xx

9. FINANCIAL REPORT, COMMENTS (1 PAGE)

The following table will summarise the costs of the project at 28th February 2003:

Cost category	Total cost according to the Commission's decision*	Costs incurred from the start date to 28.2.2003	%**
1. Personnel	305.834	na	
2. Travel	17.750	na	
3. External assistance	415.903	na	
4. Durables: total non-depreciated cost	-	na	
- *Infrastructure sub-tot.*	-	na	
- *Equipment sub-tot.*	-	na	
- *Prototypes sub-tot.*	-	na	
5. Consumables	417.903	na	
6. Other costs	63.000	na	
7. Overheads	33.797	na	
SUM TOTAL	**1.253.630**	**na**	

The project has met 40 % of the total budgeted cost at the beginning of 2003.

10. APPENDICES

1. Report on Technical Progress 1.12.2001 – 31.12.2002
2. Material Tests: Description of Test Methods