

**ENVIRONMENTAL IMPACT ASSESSMENT,
NON- TECHNICAL SUMMARY**

General

The following is a brief non-technical summary of the proposal to implement a comprehensive municipal solid waste management system in the East-Latgale region, including the construction of a new municipal solid waste landfill site for efficient disposal of produced municipal solid waste in the region. This region consists of Rezekne and Ludza district. Main towns are Rezekne and Ludza, small towns located in region are: Vilani, Karsava and Zilupe. At present about 65 thousand cubic meters of municipal solid waste are produced in region with 120 thousand inhabitants. In 2000 in East-Latgale 20 dumpsites were remediated. All of them were rather small, used by local municipalities. In region still are 28 active dumpsites but only in two of them yearly disposed waste amounts are more than 10,000 cubic meters. None of the present sites is operated in accordance with current environmental legislation and pollution and contamination occurs. After start of operation of the new landfill the existing 20 dumps will be remediated. In accordance with the requirements of EU Directive 97/11/EC on the construction of landfill sites and Latvian law *On Environmental Impact Assessment* and Regulations of the Cabinet of Ministers No 213 (1999) *On order how impact on environment has to be assessed* an Environmental Impact assessment has been undertaken by ELLE Ltd. in co-operation with Geo Consultants Ltd. (Latvia). Purpose of this study is to identify the environmental impacts associated with the project realization and to propose mitigation measures, which can be incorporated into the project to minimize any negative impacts on the environment.

Proposal

It is proposed to construct a municipal solid waste landfill where municipal solid waste from region will be disposed. In implementation of project participated Rezekne District Council as Client together with municipalities of Rezekne town and Ludza district. Project aim construction of regional municipal solid waste disposal landfill on area of approximately 25 ha, which will serve the entire region. Envisaged life period of landfill is 50 years and waste amount to be disposed is approximately 850 thousand m³. Next to active disposal zone, which will occupy approximately 12.4 ha (1st cell for first 20 years 5.6 ha and next cell for following 30 years 6.8 ha), operation of landfill will need additional area of 12 ha. This area will be needed for access roads, separation and composting, administrative building, Weight Bridge, water supply and sewage systems, leachate collection and treatment system, monitoring equipment and other facilities.

In order to secure harmless operation of landfill a significant attitude has to be paid to bottom insulation of landfill and to leachate collection system. Therefore bottom structure of landfill will consist of:

- Clayey base – 1 m
- Balance material, usually sand – 20 cm
- HDPE liner – 1.5-2.5 mm
- Special geo-membrane – 0.1-0.15 m
- Coarse sand (layer where drainage pipes will be installed) – 0.5 m.

All incoming waste in landfill will be disposed in special site and when waste layer will reach height of 2 m it will be compacted. When compacted waste will reach 2 m height it will be covered with ground material (at least 20 cm thick). On regularly basis waste will be moisturized. It will prevent risk of waste self-ignition also in dry period. Moisturizing will prevent also spreading out of dust and small waste particles out of active zone of landfilling. Landfill is planned as facility including:

- Disposal cell;
- Access roads, internal roads and operational areas;
- Leachate collection system and storage facilities;
- Buildings (administrative building, work shop and garage), including lighting conduction and fire prevention;
- Water supply and sewage system;
- Electric supply system, including lighting of the area;
- Weight bridge and control system;
- Waste sorting area,;
- Waste composting area;
- Area for delivery of waste by the public;
- Vehicle washing area with re-circulating water system;
- Artesian well for water supply at the landfill;
- Soil storage area;

- Fire fighting pond;
- Internal drainage;
- Perimeter ditch;
- Screening, using trees and bushes.

The project will be implemented in framework of the National Municipal Solid Waste Management Strategy (program "500-") adopted in the Cabinet of Ministers of the Republic of Latvia on 30 June 1998. The Strategy describes the plans for improvement of municipal solid waste management in Latvia and consists of plans for legislative, organizational, technical and financial measures to be taken. Strategy states:

- Creation of sustainable waste management system;
- Division of Latvia into 10-12 waste management regions servicing at least 100,000 inhabitants. Taking into account economical conditions of country it means construction of regional landfill facilities in accordance with Latvian and EU legal requirements. Simultaneously creation of regional waste collection and transportation systems on basis of existing or new-established organizations;
- Development of recovery, recycling and re-use activities;
- Principle "polluters-pays" application for waste producers – all waste producers have to cover costs for waste management. It has to be applied also to rural areas, where at present main part of inhabitants do not pay for waste management services;
- Drastic reduction of existing (pretty often harmful) dumps.

Program "500-" is national program, which guarantees improvement of waste management practice and reduction of harmful impacts on environment and human health.

Site selection

Sites description

In order to find location for construction of a modern regional municipal solid waste landfill municipalities in region were kindly asked to make proposals for sites. Initially 13 sites were offered from which Project Steering group has chosen 4 for further investigations:

- Sipolnieki in Pusmucova municipality;
- Karpusonki in Cirma municipality;
- Uskaunieki in Berzgale municipality;
- Križevniki-2 in Ozolaine municipality.

Procedure of Environmental Impact Assessment was started with target to assess impact of landfill to be constructed and to recommend measures for elimination or reduction of possible risks. This procedure allows all inhabitants to express their opinion about anticipated activity and to participate in decision-making.

During study all proposed sites were investigated and main attention was paid to following questions:

- Land use of area;
- Geological structure and hydro geological conditions;
- Quality of ground, surface and underground water;
- Landscape value;
- Architectural and historical monuments;
- Biological diversity.

Pusmucova municipality offered site Sipolnieki. This area is located in Ludza district, Pusmucova municipality 750 m to south from dwelling house Lahi. In southern part area has border with Zvirgzdene municipality. Distance to Rezekne on highway (via Ludza) is approximately 30 km, to Ludza – approximately 12 km. Site is located comparatively far from highways, the closest one is Ludza – Karsava highway (8 km far). New access road has to be constructed. Main area of proposed site at present is agriculturally usable land. Area has open drainage system. In eastern part of area, which was used in 80-ties in agriculture, heaps and piles of stones and wood are standing. Agricultural land is used for collection of hay. Birches and alders cover central part of site. Western part of site is agricultural land overgrowing with bushes and pine-trees.

Cirma municipality has supported wish of company Cirma bekons Ltd. to use area of this company for landfill construction. Area of site occupies 24.2 ha. Distance to Rezekne is approximately 25 km, to Ludza – 10 km. Site is closely located to Rezekne – Ludza highway and connecting road is of good quality, starting part (1.7 km) is even paved and further (4 km) gravel road. Main area of site is agricultural and forestlands. Agricultural land is abandon and

overgrowing with bushes. In central part of offered site is a depression where grows planted forest of different age. In southern part of area two storages of liquid manure from pig farms are located. In one of them manure is mixed with sawdust. In nearest surroundings grows planted forest of different species and age. In northern and western part grow birches, in southern – birches and pine trees. In southwest and northwest of area is agriculturally usable land, at present not used. In northern part seed-growing plantation is located.

Berzgaile municipality offered Uskaunieki site. Area occupies 30.0 ha but it is possible to choose site from available area of 125 ha. In close neighborhood of proposed site seven dwelling houses are located. Also planned road goes along several farmhouses. Offered site is located in distance of 12 km from Rezekne and 25 from Ludza. Site could be reached by gravel road (3 km from Rezekne-Karsava highway). Along western border of site goes railway line Rezekne-Karsava-Pitalova. Main part of area is occupied by drained agricultural land. In northern part is undrained agricultural land overgrowing with bushes. On area are small forest clusters. Parallel to railway line grow planted growths of birches and alders of average age. Pine growth is in central part of site. Southern and eastern from site are drained used agricultural lands. Northwestern from site e.g. behind railway line, forest is mixed with agricultural land. Agricultural land gradually grows over with bushes.

Ozolaine municipality offers site Krizevnik-2. Area of site is 25 ha and in direct closeness to site (250 m) one dwelling house is located. In case of landfill construction road (appr. 2 km) has to be constructed from side of road Rezekne – Zosna. Distance from site to Rezekne is 13 km, to Ludza (via Rezekne) – 32 km. Site Krizevnik-2 is located in former sand-gravel pit and meadow surrounded by forest. In pit are some small ponds, water table is 1 to 1.5 m lower than basement of pit. Walls of pit are 2-3 till 5-6 m high. In distance of appr. 500 m to northeast one more at present used sand-gravel pit is located. Partly offered site is covered also by agricultural land. Bog and growth of birch and pine trees occupy northern part.

Geological and hydro geological condition in all site (with exception of Krizevnik-2) in general are suitable for placement of landfill. Dominant are clayey sediments. In all sites anticipated activity will not significantly impact mineral resources and their quality. Different is situation in Krizevnik-2 site where landfill has to be placed on significant layer of sand and gravel. Although sand and gravel is regarded as widespread minerals and Krizevnik is not deposit of state importance, but location of landfill there cannot be regarded useful from sustainable development context and possibility to use deposit will be lost.

Pollution of groundwater in none of sites is found and anticipated activity plans to develop groundwater protection and preserving measures. An important role will play designing and construction of a qualitative landfill bottom, leachate collection and drainage systems.

All offered sites are characterized by significant areas of agricultural land, mainly abandoned. From biological diversity viewpoint all sites are rather similar. In sites anthropogenic formed biotopes are dominating. There are found 3 protected and in Latvian Redbook listed plant species, as well as several protected bird species, although areas do not contain optimal biotopes of those species. Therefore construction of landfill will not cause a significant losses for population of species.

From cultural environmental and cultural monument viewpoint construction of landfill do not causes problems in any of sites as:

- Landscape in all sites has low cultural historical value;
- In none of sites cultural monuments are found;
- None of sites is located in densely populated area;
- There will be no threats to cultural monuments in distance of 2.5-3 km.

Main impact on visual landscape will be made in Uskaunieki site. At present value of visual landscape is increased by site's close location to international railway line Rezekne – Pitalova. Construction of landfill next to railway line will cause negative association to passengers regarding Latgale landscape as landfill always is linked to visual pollution. If construction of landfill will take place there, than special plantation has to be planned.

Mitigation measures for prevention and reduction of possible impacts

As by each economical activity also by operation of landfill interference of activity and environment will take place. During elaboration of working report of EIA evaluated were those measures, which are mandatory during project implementation. Observation of them will avoid impact on human health and measure will be realized accordingly legal requirements. As main preventive measures have to be noted:

- Insulation of landfill bottom;
- Leachate collection and treatment;
- Collection and treatment of polluted surface runoff;

- Reduction of open surface and regular covering;
- Collection of biogas with further flaring;
- Treatment of sewage sludge;
- Fencing and guarding of landfill;
- Planting of plantations;
- Restriction of forestry activities along landfill;
- Control of quality of potable water;
- Qualitative work organization in landfill.

Independent from selected site for landfill construction broad spectrum of control and monitoring measures has to be implemented during operational phase and also after closure of landfill. Mandatory is registration of incoming waste, control of waste cell, as well as manifold environmental monitoring including leachate, surface water, biogas, groundwater, water in inhabitants wells, botanical. Permanent and correct parameters control will give possibility to react on failures in operation timely and avoid possible negative impacts.

Sites comparison

Taking into account large number of parameters to be evaluated special criteria were elaborated for comparison of sites. Each criterion individual scores and in accordance with them potential site having main number of scores is the most suitable for construction of landfill (see Table). In general all four sites are suitable for landfill construction as in none in sites excluding factors or conditions not allowing location of landfill there. Criteria are divided into four groups:

- Natural environment;
- Social and human health aspects;
- Economical aspects directly connected with natural environment;
- Economical aspects of landfill construction.

Table II.1 shows the comparative assessment of the four proposed landfill sites.

Table II.1 Comparative assessment of the proposed sites for landfill construction in the region of East Latgale

<i>Group of criteria</i>	<i>Number of criteria in group</i>	<i>Sipolnieki</i>	<i>Karpusonki</i>	<i>Uskaunieki</i>	<i>Križevniki</i>
Natural environment	5	19	16	20	18
Social and human health aspects	8	29	25	24	33
Economical aspects (land use)	5	22	16	17	17
Interim sum of scores given for criteria directly linked to environmental conditions	18	70	57	61	68
Economical aspects (project costs)	5	17	19	15	17
Total sum of scores	23	87	76	76	85

Natural environment for realization of anticipated activity is most suitable and minor impact will be made on environment if landfill will be located in sites Uskaunieki, Sipolnieki and Križevniki. Significantly lower estimation has site Karpusonki. In proposed site Križevniki geological conditions are not optimal for construction of landfill and are considerably more adverse than in other sites.

Regarding social and human health aspects higher estimation has and more suitable is site Križevniki, less suitable is site Sipolnieki.

Evaluating land use aspects linked with environmental and also spatial planning questions highest scores has Sipolnieki site. Considerably lower estimation have sites in Križevniki and Uskaunieki, but not suitable from this point of view is site Karpusonki.

Landfill construction is connected to significant costs and they are estimated using several criteria as comparative costs. The lowest comparative costs are to be expected in Karpusonki site, equal costs are in Sipolnieki and Križevniki. The highest costs will be in case of Uskaunieki.

Summary and Conclusion

Thus as most suitable from offered 4 sites for landfill construction in East-Latgale region have to be considered sites in Sipolnieki and Križevniki. Their ranking in assessment scale is significantly depending from landfill construction comparative costs and their importance in total sum of scores for selected criteria. Identical is estimation of sites Karpusonki and Uskaunieki although sum of criteria in different groups is different. **It has to be noted that from economical point of view landfill construction more useful will be in Karpusonki site. Impact of anticipated activity on environment will be larger but economically it could be relatively cheaper solution.**

Although conditions and characterizing parameters are different in offered sites evaluation of all criteria do not creates basis for contrast comparison of sites. Simultaneously investigation provides basis for impact reduction in each of sites and allows project realization in each of sites without considerable negative impact on environment.