

ENVIRONMENTAL MANAGEMENT PLAN
AGRICULTURAL POLLUTION CONTROL PROJECT

JULY, 2007

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ACRONYMS

PIU	Project Implementation Unit
PPU	Project Preparation Unit
LU	Livestock Unit
PCN	Project Concept Note
EIA	Environmental Impact Assessment
OP	Operation Policy
BP	Bank Policy
EMP	Environmental Management Plan
WB	World Bank
NVZ	Nitrate Vulnerable Zones
CGAP	Code of Good Agricultural Practices
MAC	Maximum Allowed Concentrations
AACP	Agricultural Acquis Cohesion Project

Introduction

Different countries show different attitudes toward the cultural and natural environment. Since the World Bank (herein and after WB or the Bank) is financing projects in more than 100 countries it established a safeguard system, stipulating minimum requirements, for assessing impacts of the project on the environment, for implementing mitigation measures and monitoring plan and for disclosing the document. Environmental management plan (herein and after EMP) is one of the safeguard instruments, applicable to this project, defined by the Operational Policy (here and after OP) 4.01. The project has been classified as a category B project since the project might have potential adverse environmental impacts on human populations and/or environmentally important areas.

The project is being prepared under the Danube-Black Sea Strategic Partnership Program-Nutrient Reduction Investment Fund under which riparian countries are eligible for Global Environment Facility (GEF) Grants for projects that help control or mitigate nutrient discharges into the Danube River and Black Sea. Activities under the GEF project will complement those under the IBRD-financed Agricultural Acquis Cohesion Project (AACP) that aims to strengthen Croatia's capacity and readiness to absorb EU pre- and post-accession funds. The project will build on the policy and legislative work of the EU 2003 CARDS financed: "Approximation of Croatian Water Management Legislation with the EU Water Acquis".

The purpose of this EMP is to review environmental issues specific to investments that will be carried out under the Agricultural Pollution Protection Project, and to present project specific mitigation measures and monitoring plans that describe actions to mitigate potential environmental impacts. This document will also review impacts to cultural heritage.

Expected environmental impacts, specific to this project, are related to spatial interventions, i.e. construction works and they present following pressures to the environment: waste generation, noise pollution, air pollution, habitat disturbance, water pollution, hazardous material generation. All these pressures imply relatively common mitigation measures and monitoring plan.

Project description and identification of activities impacting environment

Objective of the project

The overall development objective **of the project** is to increase significantly the use of environmentally friendly agricultural practices by farmers in Croatia's Pannonian plain in order to reduce nutrient discharge from agricultural sources to surface and ground water bodies. The global environmental objective of the project is to reduce the discharge of nutrients into surface and groundwater in watersheds draining into the Danube River and Black Sea.

Project components

Project comprises three components.

Component 1. Promotion of Mitigating Measures for Reducing Nutrient Loads to Water Bodies. This component will assist the government of Croatia to promote improved watershed management practices with the objective of reducing nutrient loads to the surface and ground water bodies of Croatia from agricultural sources. Activities under this component will assist Croatia to implement the EU Nitrates Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources. The project will provide grants for 75 percent of the cost of remedial interventions, such as management of livestock waste, including manure storage, composting, and its application on crop land, as well as support for the application of the Code of Good Agricultural Practices (CGAP) such as integrated cropping management, nutrient management, conservation tillage, buffer strips, etc. in potential Nitrate Vulnerable Zones (NVZ). Beneficiaries of these investments will include commercial, private farmers with dairy herds of 10—100 cows as well as commercial small- to medium- sized pig and poultry farms that are sources of nutrient pollution.

Component 2. Public Awareness and Replication Strategy. A local and nationwide public information campaign will be undertaken to disseminate the benefits of proposed project activities and achieve replicability of the same. The project will finance the organization of regional and national workshops, field trips, visits, training, publication in international agriculture and environmental journals and other activities to promote the replication of project activities in other similar areas of Croatia as well as Black Sea riparian countries. The project will benefit from ongoing similar efforts in Georgia, Bulgaria, Poland, Moldova, Romania, and Turkey, and the exchange of experiences will help in contributing significant reductions in the nutrient loads entering the Danube River and Black Sea.

Component 3. Project Management. The AACP Project Implementation Unit (PIU) established within the MAFWM Department for Policy, EU and International Relations will implement the proposed GEF-supported APCP, with the support of one additional technical specialist. The project will also provide two incremental staff to Department of Agriculture, Department for Market and Structural Support in Agriculture (future Payment Agency) to support the processing of grant applications.

Identification of works

Physical investments that might have impact on the environment are identified in the Component 1. These investments are:

- Construction of manure management platform/ waste collection sites
- Implementation of the Code of Good Agricultural Practices such as tree planting as protection buffers, riparian buffers, erosion control, grazing management and nutrient management plans
- Expansion of groundwater monitoring wells

Beneficiaries of these investments will include commercial, private farmers with dairy herds of 10—100 cows as well as commercial small- to medium- sized pig and poultry farms that are sources of nutrient pollution.

Choice of sites

During the preparation of the APCP, the consultant work has been done to:

- assess the current institutional settings and policy efforts made by the Croatian authorities for reducing nutrient load deriving from agricultural practices into water

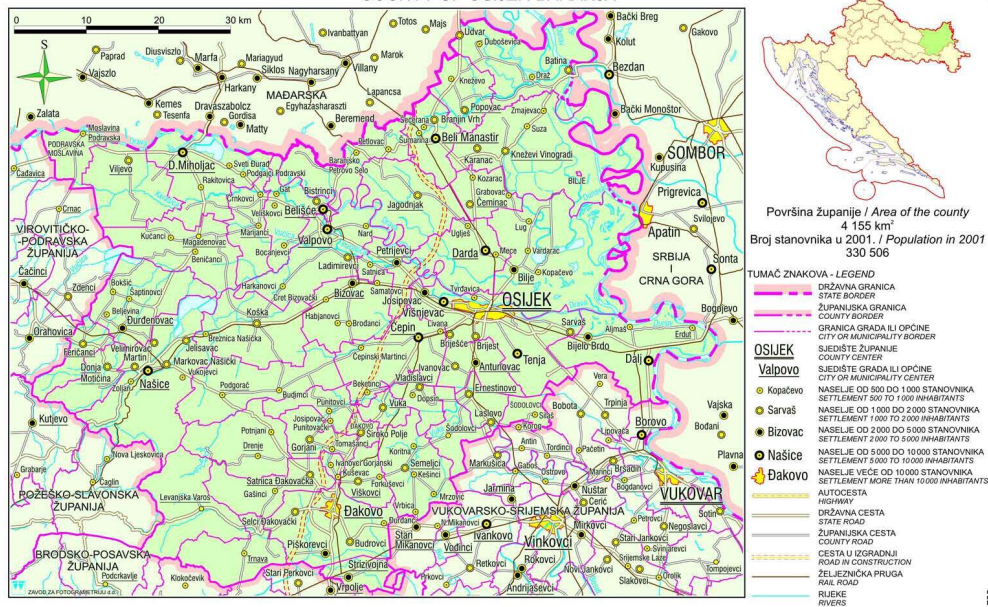
- make an assessment of the current situation in regard to water pollution from nutrients deriving from agriculture
- propose pilot regions and a set of activities demonstrating good agricultural practices in regard to nutrient management and water protection.

The nitrogen content of the major rivers of the Danube basin, which is also Croatia's most intensive agricultural area, fails to meet the prescribed MAC for rivers. The eutrophication process has been enhanced in most Croatian lakes and their phosphorus content is far above the prescribed parameters. In 2000 only 30 percent of Croatian spring water (largely reflecting the quality of the ground water) met prescribed nutrient content standards. In the period 2000-2003, drinkable water at 87 percent of monitored locations exceeded the MAC for nutrients. In the period 2000-2006, one out of every three analyzed samples from private wells exceeded the MAC for nitrates.

Osijek-Baranja, Varaždin and Vukovar-Srijem County have been selected as the three pilot regions suitable to take part in the project for its high agricultural production and high nitrate load in waters. All three regions are mostly flat and have fertile alluvial soils. The total UAA is 343,684 ha, accounting for nearly one third of the entire UAA and 26 percent of all LU in Croatia. Intensive arable farming run by small to medium scale family farms prevails and family farms occupy 63 percent of the total UAA. Cereals are by far the most important crops, using about two-thirds of the entire arable land. In Osijek-Baranja and Vukovar-Sirmium Counties, cattle and pigs account for more than 85 percent of all LU. In Varaždin County poultry is the most predominant, accounting for 39 percent of all LU. In all three regions nutrient supply is out of balance with crop requirements. The biggest problem is nitrogen whose drastic reduction (40-90 percent) should be made in order to meet actual crop requirements. In Osijek-Baranja and Vukovar-Sirmium Counties, fertilizers account for 80-85 percent of all N supplied by fertilizers and manure, while in Varaždin County due to intensive livestock farming, notably poultry production, fertilizers and manure make up an approximately equal share in terms of N load.

A significant part of the land in all three regions is situated above underground water reserves and three major Croatian rivers pass here (Danube, Sava, Drava). The available evidence suggests that the situation regarding nitrate content in both surface water and water supplying private wells is worrying. In the last years 71 percent of all examined surface water and 49 percent of all water samples taken from private wells have exceeded the prescribed MAC for nitrates.

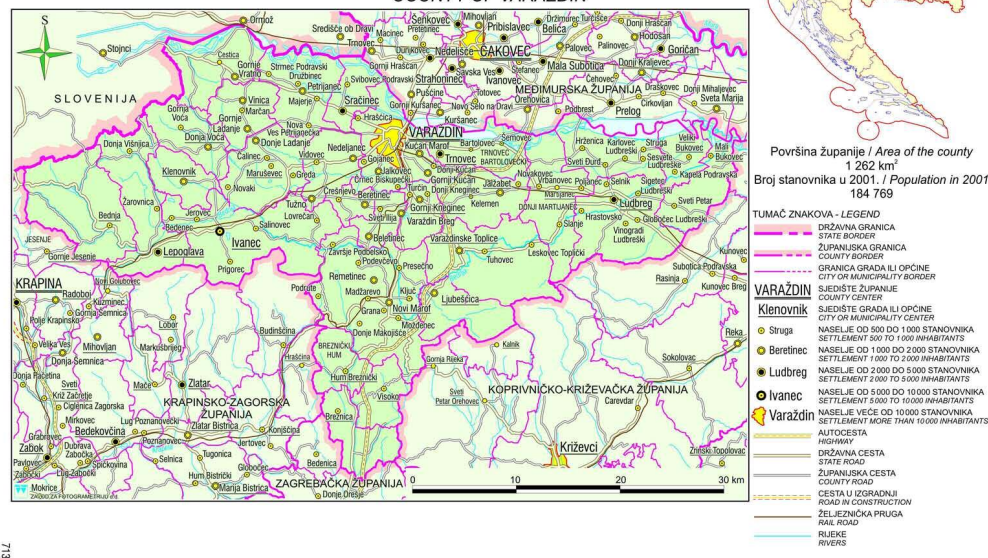
XIV. OSJEČKO-BARANJSKA ŽUPANIJA COUNTY OF OSJEK-BARANJA



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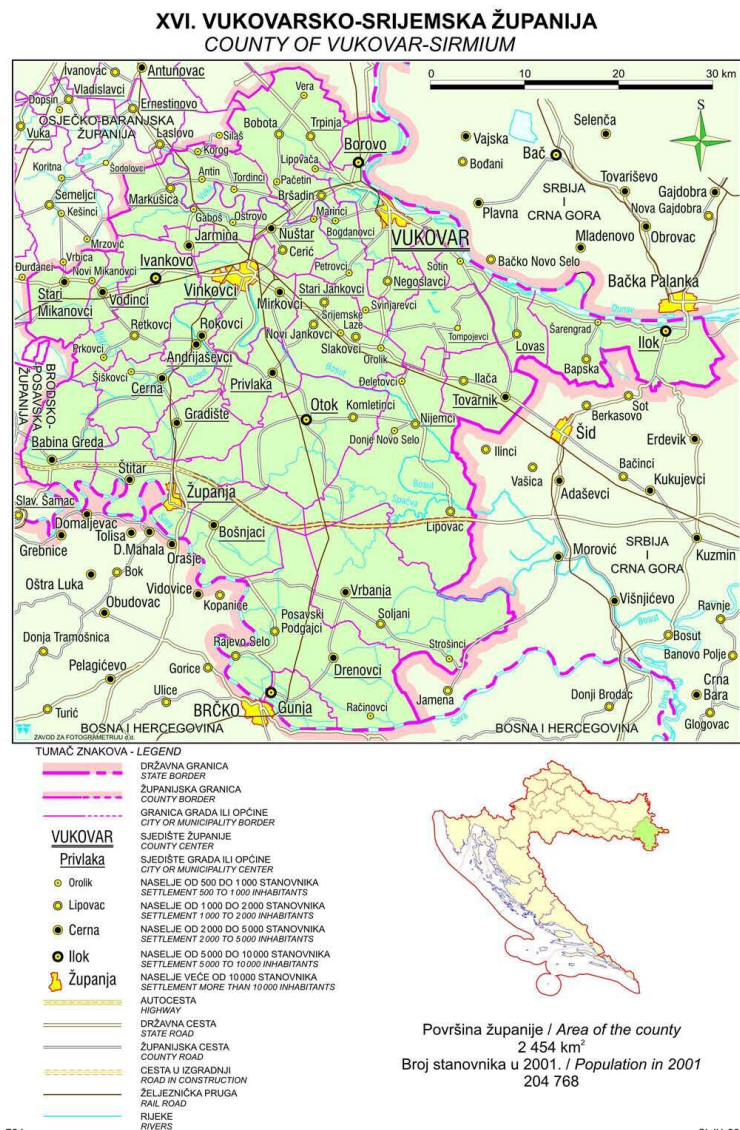
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Scope of the EMP

The report for the preparation of EMP covers:

- (i) An overview of project components and identification physical investments / actions envisaged under the project which might have significant impact to environment;
- (ii) the policy, legal and administrative framework, including the role and responsibilities of the MAFWM and other agencies in this project related to environmental issues; the environmental and construction permitting process of Croatia applicable to the proposed works; and

- (iii) in line with identified potential impacts and effects, suggested mitigation measures, including possible changes to environmental impact assessment and mitigation procedures, preparation of guidelines and practical suggestions, and related training.

Three types of investments/activities have been identified as ones which might have potential impact on the environment:

- Construction of manure management platform/ waste collection sites
- Implementation of the Code of Good Agricultural Practices such as tree planting as protection buffers, riparian buffers, erosion control, grazing management and nutrient management plans
- Expansion of groundwater monitoring wells

The mitigation measures and monitoring will be identified for construction of manure platforms/ waste collection sites. The CGAP based on EU good practices, by it self presents environmentally friendly measures and will require additional measures. The farmers will be educated on CGAP, to avoid any misinterpretation and malpractice of the same. The network of monitoring wells, financed from the grant component 1 will be established on each farm where manure management platform will be constructed, therefore will serve by itself as monitoring tool. A special consultant who will work together with Croatian Waters, PIU and Paying agency will agree on siting of the wells depending on hydro geological profile. Monitoring of groundwater will be the responsibility of Croatian Waters. Results should show the impacts on the nitrate level in the vicinity of farms.

The project investments will trigger the following WB policies: OP/BP 4.01 Environmental Assessment and OP 17.50 Disclosure Policy.

Policy, legal, and administrative framework

WB policies related to project investments

APCP requires preparation of environmental assessment (EA) to help ensure that reconstruction / construction of facilities are environmentally sound and sustainable based on OP/BP 4.01 Environmental Assessment . The Bank undertakes environmental screening of each proposed project to determine the appropriate extent and type of EA. The Bank classifies the proposed project into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. In this way risks associated with project actions can be effectively anticipated in advance before project implementation, and addressed by direct mitigation activities in the design, planning and construction supervision process as well as during the operation of the facilities.

The project has been classified as a category B project since the project might have potential adverse environmental impacts on human populations and/or environmentally important areas. For all Category B projects an Environmental Management Plan needs to be prepared.

Croatian policies related to project investments

By analyzing the investments envisaged under the APCP, that might have significant impacts on the environment, procedures for legal actions have been determined, according to Croatian legislation.

For the construction of manure management platform/ waste collection sites, procurement of location permit, construction permit and operation permit is required.

For the Expansion of groundwater monitoring wells, neither location, nor construction permit is necessary.

Procedures preceding construction in Croatian legislative are: **land acquisition, environmental impact assessment (EIA), location permit** procurement, **construction permit** procurement and **operation permit**. For the type of activities envisaged under APCP Project EIA is neither required nor suggested.

Location permit

The Location permit is an administrative document defined by the Law on Physical Planning (Off. Gazette no. 30/94, 68/98, 35/99, 61/00 and 32/02). It is issued based on Physical Planning document and on special related laws and regulations.

The Location permit defines important characteristics of planned intervention like: form and size of construction lot, purpose, size (height, number of floors) and area of the constructed object, auxiliary objects on construction site (storages, septic tanks, etc.), architectural form of the object (roof, materials and other factors depending on surroundings), site organization, methods and conditions of connection of the object to public traffic surface (including parking lots) and communal infrastructure, mitigation measures related to environment (if intervention notably effect environment by its operation) and other elements important for spatial intervention. Location permit needs to be issued for every spatial intervention, except for cases specially defined under regulations (The Ordinance on Spatial Intervention that do not Require Procurement of Location Permit - Off. Gazette no. 86/04 and 138/04).

If construction works are performed on an object protected as cultural monument, prior to any kind of works (for spatial intervention that do not require location permit) it is necessary to obtain an official approval from the regional authorized body (Regional Office for Monument Protection).

Construction permit

The Construction permit is an administrative document defined by the Law on Construction (Off. Gazette no. 175/03 and 100/04). After verification and issuance of this permit construction may start. Construction permit confirms that the Main project is in compliance with Location permit and all special conditions issued by authorized bodies and obtained in the Location permit procurement procedure. In addition, Main project conformity to important construction regulations defined in the Law on Construction are evaluated. For instance: mechanical resistance, stability of building, fire protection, sanitary health and environmental conditions, operational safety, energy efficiency, thermal insulation, access and mobility in the object. The ownership and the construction rights on the parcel are as well defined.

For attaining Construction permit it is necessary to submit an evidence that legal or physical entity submitting the request for permit has a right to build on the parcel in question.

Croatian parliament is currently assessing the newly proposed Construction law. This implies that the procedure in recent time might change and EMP on this section will need to be revised.

Operational permit

Operation permit is issued after the technical assessment of the constructed object, if proven that the object has been constructed in compliance with Construction permit requirements and the Main project.

Water-administrative permit for monitoring wells

Unless the well is intended solely for the use of the household, issuance of the water administrative conditions is needed. The conditions are issued by Croatian waters. They ensure protection from water, pollution protection of water, legal usage and water management. They are issued based on technical specifications proposed by geologist who based it on the geological analysis, location, borehole geological analysis, etc. Monitoring well construction can only be done by registered geologist.

EMP and administrative procedures preceding construction

The Environmental Management Plan (EMP) comprises procedures to recognize and control the quality of environment and to identify and implement measures in the process of realization of investment, aiming at mitigation of negative environmental impacts and environmental protection.

EMP is not a requirement in Croatian laws and acts, i.e. EMP as an obligatory or binding document does not exist in the preparation of any investment projects, however some elements usually found in EMP are prescribed in permits and documents preceding construction, whose supervision is under the jurisdiction of different Ministries and agencies (annex 2).

Environmental aspects

Identification of possible environmental issues

The activities supported by the project comprise as described in the scope of the project, the construction of manure management platform/ waste collection sites, implementation of the Code of Good Agricultural Practices and expansion of groundwater monitoring wells.

According to Croatian Laws, for the construction of proposed type of facilities and envisaged actions, the Environmental Impact Assessment (EIA) is not necessary, which indicates that the impacts on the environment by this type of projects are limited.

Possible environmental issues for building manure management platforms and monitoring wells can be clearly separated in two categories, one related to construction and other related to operation.

The main type of environmental issues that derive from the actions during construction / reconstruction are following:

- Dust and noise due to the demolition and construction
- Disposal of construction waste
- Sediment loads in waterways in case of necessary stream crossing or during construction of wells
- Possible negative impacts on cultural finds

while the one related to operation are:

- Risk associated with handling wastes during operation (municipal, hazardous, etc.), which includes mixing of other waste with organic
- Leakages from the manure storage facilities (if construction is not made according to specifications);
- Improper cleaning of the individual manure storage tanks and large manure platforms;
- Inappropriate manure spreading in the fields if code of good agricultural practices are not followed properly
- Poor siting and use of existing storage facilities; and
- Methane venting and odor related issues
- Improper closing of the wells

Extension of monitoring network will have positive impacts on the environment and will enable tracking of the nutrient pollution in pilot farms.

All these risks can be effectively dealt with, if they are recognized through this EMP in pre-design phase. In this project, implementation **of mitigation measures can be advised at the stages of: design, construction/reconstruction and operation.** These measures should be feasible, and cost effective aiming at eliminating, offsetting and reducing adverse environmental impacts. The measure should not only deal with recognized risks, but should as well be used as guidance to make facilities more environmentally friendly and sustainable.

Environmental Guidelines

The Environmental Guidelines address environmental and ecological/biologic concept, design and planning of new waste platforms and guideline for construction. The guidelines cover the handling of construction debris generated, selection of construction materials and construction methods with limited impact on the environment, energy saving methods as well as the handling of hazardous and non-hazardous wastes, and storage of hazardous materials under project supported activities. The guidelines are a base for design, training, research, discussions and workshops.

Design phase

In the design phase many important issues could be approached, investigated and best choices incorporated into design. The location of waste platforms will be on farm. Special attention should be given to siting of the waste platform. It should not be close to open waterways, to minimize potential pollution of surface waters and should be on a certain distance from households to minimize odors. Sizing of the waste platforms have to be done in a way to store manure in quantity for min of 6 months. At this time, a feasibility study has been done for waste platforms in all three counties. Within this study, two types of manure storing structures have been preliminary designed, calculated and price estimated. Structure 1 is an above ground manure storage facility with an underground storage tank/pit for seepage of liquid manure/effluents and rainfall. Structure type 2 is an underground basement/pit for storing slurry. The recommendation for technical requirements for materials are

given in annex 3. The expert staff from the MAFWM should participate in a design phase of the project to ensure that the design and construction will be done in accordance to Croatian standards and norms. All the documentation for the platforms will be done by the farmer's contractor and to ensure quality the whole process will be supervised by the Paying Agency. During the process of applications farmers will have to prepare all the documentation mentioned in chapter 3.2. if applicable.

Monitoring wells should be designed based on geological profiles. In annex 4, some usual practices are shown for monitoring wells construction. To avoid hazards during operation, casing cap with lock should be mandatory.

Construction / reconstruction phase

In the construction phase the emphasis is on possible environmental impacts that follow construction works. Issues that could be addressed are: construction and other waste management, minimization of dust and noise, top soil management, procurement of construction material, site restoration, temporary storage of the material, storage of hazardous materials, archeological and cultural finds, traffic management plan, working hours, encroachment into the neighbor territory.

Noise reduction

Before any beginning of the work it is recommended to inform neighbors either directly or through local bulletins or newspapers on the construction of new objects and reconstruction. The noise should be limited by using good management practice and limiting works on regular daily shift. The equipment and machinery used should be calibrated according to the Ordinance on Highest Permitted Levels of Noise in Working and Living Environment (Off. gazette 145/04) and the Law on Noise Protection (Off. gazette 20/03).

Dust minimization

Temporary technical solutions and measures for dust minimization during construction should be used. For the transportation of earthlike or any other dusty material to the construction site or of the construction site watering or covering of the cargo should be implemented. Reduction of dust on construction / reconstruction site during dry season of the year can be accomplish by watering the ground surface. Water should not be wasted. Reducing speed can be another applicable measure.

Preventing sediment loads in waterways

Preventing sediment loads in waterways can be prevented by proper siting of waste platforms and construction site. All earthy material should be managed in a way to prevent washing out into existing surface waters.

Construction waste

When waste is separated as advised in the Law on Waste (Off. Gazette no. 178/04, 115/06) it is more manageable. For non recyclable wastes, in arrangement with municipality waste will be deposited on legal landfills. Open burning and illegal dumping of any waste is strictly prohibited.

In addition to solid waste, some amounts of hazardous wastes will be produced on the site: like the remaining from paints, oiled packaging, oils, material contaminated with oil etc. The procedure on handling this type of waste is defined in the By-law on Hazardous Waste Management (Off. Gazette no. 123/97) and the Ordinance on Categories, Types and Classification of Waste (Off. Gazette no. 50/05). All waste has to be collected and handed over to the company authorized for collection and transportation of hazardous waste.

Top soil management

Stripped top soil should not be thrown, but kept on the site for restoration after completion of works. Any prevailing trees and valuable vegetation should as well be stored and used later for restoration.

Site organization and restoration

Construction sites should be fenced off in order to prevent entry of public, and general safety measures would be imposed. Temporary inconveniences (traffic or other) due to construction works should be minimized through planning and coordination with contractors, neighbors and authorities. After completion of works the site should be restored as planned in the design. All wastes and machinery should be removed from the location.

Temporary storage of material (including hazardous materials)

Stockpiling of construction material should be avoided if possible. If not, construction material should be stored on the construction site, and protected from weathering. Hazardous materials like paints, oils, additives and others should be kept on impermeable surface, and adsorbents like sand or sawdust should be kept for handling small spillage. Handling with the material should be consistent with the instructions on Material Safety Data Sheets.

Encroachment into neighboring territory

Encroachment into neighboring territory should be avoided if possible. In case where maneuvering surface is too small, approval for the encroachment should be asked. Any accidental damages of the neighboring properties should be recovered and brought in the condition as it was prior to the construction.

Archeological and cultural finds

If encountering archaeological finds during preparation of the site for the construction, the contractor should stop the works, respond immediately and notify the municipal authorities, the Regional Institute for Protection of Cultural and Historical Heritage and the project team in the MAFWA.

Working hours

To avoid noise and disturbance of neighbors the works should be conducted in a daily shift, meaning from 7 am to 5 pm. For other working hours special permits are required.

Operation

During the operation the main emphasis should be on proper maintenance.

Maintenance

All farmers should be educated in good practices related to maintenance of waste platforms. This training should include actions related to accumulation of liquid fractions due to the

heavy rains, proper waste management, proper handling of manure to minimize odor and methane venting, proper cleaning of platforms, and proper application / spreading of manure.

Monitoring

The consultants have prepared the Water quality monitoring program for 3 selected counties. This report serves as preliminary study for the extension of monitoring wells network. It provides the review of performance of current monitoring of both surface and groundwater and gives recommendations for improving the existing program by installing additional monitoring wells. The report envisages a set of three monitoring wells installed (depth 5, 10 and 15 m) on each farm where program will be implemented for tracking point source pollutions. Frequency of sampling should be 1 in 2 months. For tracking diffuse source pollution several lysimeters are envisaged to measure water percolation from the soil surface through the root zone to deep horizons, i.e. leaching of the nutrient and toxic substances.

Mitigation

PHASE	ISSUE	MITIGATION MEASURES	COSTS	INSTITUTIONAL RESPONSIBILITY	COMMENTS
DESIGN	Reviewing design plans for construction of waste platforms	Implementation of measures proposed by EMP	Not significant cost, this should be regular work of consultants hired by PIU	Contractor's design team, PIU	This is not a legal requirement, but it is recommended to become a binding requirement
	Impact on landscape and siting	Platforms shall be designed according to local constructing practice (respect of surrounding landscape) and on certain distance of open waterways to minimize potential pollution of water surfaces and on certain distance from households to minimize odor impacts	Included in cost of procurement of construction permit	Reviewed by institution issuing construction permit Regional Office for Construction (under MEPPPC ¹)	
CONSTRUCTION	Noise	Construction is restricted to 5 days a week and only dayshift (7 am to 5 pm). Machinery has to possess attest (needs to be calibrated for certain noise level)	Not significant. This cost is included in regular annual process of technical examination of machinery and equipment, and it is needed to issue a work attest.	Contractor	Should be specified in bidding documents (compliance with EMP)
	Dust	Dust from demolition and transportation of construction material and waste will be minimized by use of water, by minimizing speed of vehicles and enclosure of cargo	Could be significant if construction is done in the dry period of the year. Cost should be borne by the contractor.	Contractor	Will be specified in bidding documents (compliance with EMP)

PHASE	ISSUE	MITIGATION MEASURES	COSTS	INSTITUTIONAL RESPONSIBILITY	COMMENTS
CONSTRUCTION	Construction waste	<p>Hazardous waste is expected in small quantities and it has to be separated from solid waste</p> <p>For hazardous waste (paints, oils, etc.) contractor has to follow procedure for hazardous waste management, this implies collection, handing over the waste to authorized company for hazardous waste management and fulfilling accompanying documentation</p> <p>All recyclable fractions have to be separated from non recyclable waste and taken to appropriate collection points with accompanying documentation</p> <p>Non recyclable waste has to be take to approved landfill</p> <p>The building site will be cleaned and all debris and waste materials will be disposed of in accordance with clauses specified in the bills of quantities</p> <p>Burning or illegal duping of waste is strictly forbidden</p>	Not significant (depending on quantities of hazardous waste) All costs should be beard by contractor.	Contractor (or other entity, depending on the Contract)	<p>Will be specified in bidding documents (compliance with EMP)</p> <p>The By-Law on Hazardous Waste is going to be updated in 2007, therefore revision will be necessary</p>
CONSTRUCTION	Degradation of historical or culturally important sites - "chance finds"	<p>Supervising construction,</p> <p>If encountering archaeological finds during preparation of the site, the contractor should stop the works and follow the procedure to notify authorized bodies</p>	Not significant cost All costs should be beard by contractor.	Contractor	<p>Notify:</p> <p>Municipal Authorities,</p> <p>Regional Institute for Protection of Cultural and Historical Heritage</p> <p>Project Team in MAFWM.</p>

PHASE	ISSUE	MITIGATION MEASURES	COSTS	INSTITUTIONAL RESPONSIBILITY	COMMENTS
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PHASE	ISSUE	MITIGATION MEASURES	COSTS	INSTITUTIONAL RESPONSIBILITY	COMMENTS
OPERATION	Waste management	Only organic waste from the farms should be put into the waste platforms. In case of over accumulation of liquid fraction, pumps should be used and waste spread on the fields. Same should be done for composted manure.	Not significant through period of years, should be paid by Operator and not from the loan	Operator	
	Maintenance (avoiding water and soil pollution and odors)	All maintenance of the facilities should be done in accordance to Good Agricultural Practices. Advices on possible issues should be sought from the SAPARD agency and MAFWM PIU.	Not significant through period of years, should be paid by Operator and not from the loan	Operator	

Monitoring Plan and Supervision

Monitoring of construction is a part of procedure for obtaining Operation permit.

PHASE	WHAT Parameter is to be monitored?	WHERE Is the parameter to be monitored?	HOW Is the parameter to be monitored?	WHEN Is the parameter to be monitored (frequency)?	WHY Is the parameter to be monitored?	COST	RESPONSIBILITY
Design	Implementation of EMP guidelines (RECOMMENDATION)	Design project for construction, reconstruction and adaptation	Review of elaborates and adaptation designs	Prior approval for construction as part of project monitoring program	It is recommended for the reason that adaptation by Croatian law do not need construction permit.	Should be part of the project	MAFWM, contractor's designer
Construction	Parameters given in construction permit - all special conditions of construction issued by different bodies	Main project documentation	Part of regular inspection of MEPPPC (regional offices)	During the construction, and before Operation permit is issued	Regular review stipulated in the Law, and if any public complaint is sent to the Ministry (MEPPPC)	Included in the process of construction, cost of the contractor	Supervising engineer and Regional Construction Inspectorate (under MEPPPC)
	Construction waste management (including hazardous)	Waste accompanying documentation that is submitted to MEPPPC		After reporting on waste management in MEPPPC	Required by series of regulation on waste	Cost of MEPPPC and small cost for contractor	Supervising engineer MEPPPC
Operation	Waste management	Thru waste accompanying documentation that is submitted to MEPPPC,	Reports to MEPPPC	After reporting on waste management in MEPPPC,	Required by series of regulations on waste	Cost of MEPPPC and operator	MEPPPC
	Ground water monitoring	Through newly installed piezometers (monitoring wells) on pilot farms	HV will report to MAFWM and PIU at MAFWM	One piezometer every two months	One of the project performance indicators to track the changes in nitrogen level	Cost will be bared by HV and will not be covered from the grant	HV and MAFWM

EMP Implementation Responsibilities

The MoF as a recipient of the grant will make sure that PIU at MAFWM is qualitatively staffed to carry on jobs of supervision of mitigation measures and monitoring as described in EMP. Members of the SAPARD Paying Agency (under MAFWM) formed under AACP will work closely with the PIU. The PIU will make sure that all the necessary licenses and/or permits are obtained from related environmental agencies prior to and during construction phase. The AACP Project Implementation Unit (PIU) will serve as the Project Preparation Unit (PPU) and then as the PIU for the proposed GEF project, with the PIU Project Manager expected to oversee implementation of the GEF-supported activities. A Project Steering Committee has already been established comprising representatives from the MAFWM, Ministry of Environmental Protection, Physical Planning and Construction (MEPPPC), and Public Water Management Enterprises to provide guidance and advice on effective and efficient implementation of the proposed activities.

The MAFWM is responsible for proper implementation of the EMP that covers both the construction and operational phase. During the construction phase, with assistance from consultants, PIU and members of the MAFWM SAPARD Paying Agency will carry out the supervision of the works carried out by the contractor and ensure that the EMP is followed properly. During the operational phase, the MAFWM will be responsible to follow the EMP in a satisfactory manner. The PIU will report to the Bank and MAFWM about the condition of compliance with the environment within the scope of project at regular intervals on biannual basis. The compliance with EMP will be described in regular Progress reports as it will be requested by Project/Loan Agreement. The monitoring prescribed in EMP comes from the Croatian environmental legislation and therefore will also be supervised by the inspection of Ministry of Environmental Protection, Physical Planning and Construction and Croatian Waters.

MAFWM will implement the overall project, and oversee environmental compliance of the project during design phase, construction and operation phase and ensure that monitoring and mitigation plan of EMPs is being implemented. Environmental Inspectors within the Ministry of Environmental Protection, Physical Planning and Construction, together with environmental specialists from the PIU and the Bank (during the missions) will provide supervision based on unannounced site visits during construction and operation of related to construction conditions and environmental protection.

The disbursement of the matching grant funds for investments under Component 1 will be established through a Competitive Grants Scheme (CGS) implemented by the MAFWM SAPARD Paying Agency. The Agency is already receiving capacity building support from the AACP Loan for such efforts. Subject to a satisfactory fiduciary review by the World Bank, the Paying Agency would apply EC accredited IPARD payment systems and procedures for the disbursement of GEF payments for manure storage.

Capacity development, training and proposed project organization

Related to conclusions originating from comparing permits procurement procedures and EMP and bearing in mind administrative organizations and jurisdiction of administrative bodies participating in the process of issuance of permits, integrating existing institutional organization of environmental protection, it is necessary to arrange activities in accordance to jurisdiction of state and regional bodies, but as well arrange some new activities for which organization has to be made up.

- Potentially the weakest link and most influential part related to proper construction of the facility is in a design phase and for that reason a special attention and supervision

during that stage is recommended. A team of representatives of MAFWM and designer should be formed and measures recommended in EMP incorporated.

- Most of the potential environmental impacts will come from poor management, i.e. not following in a proper way good agricultural practices, therefore a special attention should be given to training of the farmers.
- **Making EMP part of the contract to Constructor and making it binding condition is strongly recommended. If not, all recommendation on construction, mitigation and monitoring conditions related to design and construction should be specified in the contract and assigned to contractor and/or farmer.**

The project will finance two additional staff members to support the application, processing, payment and control of GEF to Payment Agency management.

PUBLIC DISCLOSURE

The draft EMP will be available to public for comments, questions and suggestions through the website of the Ministry of Agriculture, Forestry and Water Management in Zagreb for 3 weeks starting with July 30, 2007. All received comments will be attached to the final document. Varazdinska, Osijek -Baranja and Vukovar-sirmium county will display the note at their information board on the publication of the EMP on the MAFWM's website and the requested comments on the future constructions.

APPENDICES

THE LIST OF THE NATIONAL LEGISLATIVE AND SUB -LEGISLATIVE ACTS REGULATING ENVIRONMENTAL PROTECTION

Environmental and Nature Protection

- The Law on Environmental Protection - Off. Gazette No. 82/94, 128/99, 107/03
- The Law on Physical Planning (Zoning) – Off. Gazette No. 32/02, 35/99, 68/98, 30/94
- Regulation on Environmental Impact Assessment – Off. Gazette No. 59/00, 136/04, 85/06
- By-Law on Environmental Information System - Off. Gazette No. 74/99 and 79/99
- Environmental Protection Emergency Plan - Off. Gazette No. 82/99, 86/99, 12/01, 14/01
- Ordinance on Environmental Emission Inventory - Off. Gazette No. 36/96
- The Law on Nature Protection - Off. Gazette No. 70/05
- The law on Cultural Monuments Protection - Off. Gazette No. 52/94
- The Law on Environmental Protection and Energy Efficiency Funds - Off. Gazette No. 107/03
- The Law on Protection and Preservation of Cultural Values - Off. Gazette No. 69/99
- Ordinance on Mammal Protection (Mammalia) - Off. Gazette No. 31/95
- Ordinance on Birds Protection (Aves) - Off. Gazette No. 43/95
- The Law on Acceptance of Convention on the Conservation of European Wildlife and Natural Habitats (Bern convention) - Off. Gazette No. 6/00

Air protection

- The Law on Air Quality Protection- Off. Gazette No. 178/04
- By-law on Recommended and Limit Values of Air Quality - Off. Gazette No. 101/96, 2/97

Water Protection

- The Law on Water - Off. Gazette No. 107/95, 150/05
- The Ordinance on Issuance of Water Management Documents - Off. Gazette No. 28/96
- By-law on Hazardous Substances in Water - Off. Gazette No. 78/98
- Regulation on Limit Values of Indices, Hazardous and Other Substances in Waste Water - Off. Gazette No. 40/99, 6/01, 14/01
- Instructions for Keeping Records on The Frequency of Discharging of Hazardous and Harmful Substances into Water, of Quantities and Composition of Such Substances, and on the Procedures of Submitting Such Data to Public Water Management Enterprises - Off. Gazette No. 9/90
- Decision on Water Use Charge - Off. Gazette No. 15/91, 19/92, 79/92, 84/92, 1/94
- Decision on Water Protection Fee - Off. Gazette No. 15/91, 19/92, 79/92, 84/92, 1/94
- Decision on Determining Catchments Areas –Off. Gazette No. 20/96, 98/98, 5/99
- Regulations On The Establishment Of Sanitary Water Source Protection Zones – Off. Gazette No. 55/02.
- The List of Authorized Laboratories – Off. Gazette No. 107/00
- National Water Protection Plan – Off. Gazette No. 8/99

Noise Protection

- The Law on Noise Protection - Off. Gazette No. 20/03

- The Ordinance on the Highest Permitted Levels of Noise In Working and Living Environment- Off. Gazette No. 145/04
- The Ordinance on Conditions to be Fulfilled by Companies which Measure and Forecast Noise In Working and Living Environment - Off. Gazette No. 37/90

Waste Management

- The Law on Waste - Off. Gazette No. 178/04, 153/05
- Ordinance on Waste Types - Off. Gazette No. 27/96
- Ordinance on Waste Management Requirements - Off. Gazette No. 23/07
- By-law on Hazardous Waste Management - Off. Gazette No. 32/98
- Ordinance on Packaging Waste - Off. Gazette No. 32/98
- By-law on unit fees, corrective coefficients, approximate criteria and measures for setting charges on burdening the environment with waste - Off. Gazette No. 71/04

ROLES AND RESPONSIBILITIES OF THE AUTHORITIES

MINISTRY OF AGRICULTURE, FORESTRY AND WATER MANAGEMENT

The Ministry of Agriculture, Forestry and Water Management (MAFWG) is responsible for a wide range of issues related to agriculture, rural development, fisheries, forestry, hunting and water management. The MAFWM is the main government body responsible for the protection of agricultural land from pollution by harmful substances and integrated water management. Besides making strategic planning and legislation, the Ministry is also in charge of inspection, preparation and issuing permits for (among others): Mineral fertilizers and veterinary medicines, Import and trade of plant protection agents, Water management permits and permit ordinance, Water utilization and waste water discharge.

The MAFWG has a major role in assuring integrated water management at the national level, water quality management legislation and related policy development. These tasks are carried out by the Directorate for Water Management which has a major role in protecting water from pollution caused by adverse agricultural practices. The Directorate has about fifty staff working in five departments: Department on Water Management Inspection, Department on Water Protection, Department on Water Use, Department on Protection from Adverse Effects on Water and Department on Water Policy and International Projects.

The Directorate for Agriculture is responsible for coordinating various ministry efforts on good agricultural practices. Since recently it has also been in charge of agri-environment related legislation. Protection of agricultural land from pollution by harmful substances makes also an important task of this unit. The Directorate also plays a key role in developing policies on direct payments for crop and livestock production and various aspects having a far reaching consequence for sustainable soil (nutrient) management.

Policy development regarding rural areas and co-ordination of the EU SAPARD/IPARD program are the main tasks of the Directorate for Rural Development and SAPARD. This Directorate is also in charge of organic farming and agri-environment measures.

MINISTRY OF ENVIRONMENTAL PROTECTION, PHYSICAL PLANNING AND CONSTRUCTION

The Ministry of Environmental Protection, Physical Planning and Construction (MEPPPC) is responsible for legislative development, strategic planning, permitting, monitoring and inspection in the field of environmental protection. It is in charge of protection of air, soil, climate change and ozone layer protection, coastal zone, sea, waste management and environmental impact assessments. The ministry is responsible for the overall policy and the administrative tasks regarding environmental protection, but its involvement in water protection policy is limited. However, as the main government organization responsible for environmental protection it is involved in various national steering committees, task forces and expert panels on water. It closely cooperates with MAFWG, Croatian Waters and other water-related organizations.

CROATIAN WATERS

Croatian Waters is a public company in charge of water management. It collects water-related taxes which make the main organization revenue. Croatian Waters are responsible for the preparation of water management plans, maintenance of water-related infrastructure and protection from the detrimental effects of water. Besides, the organization deals with various water use and water pollution control issues and carries on permitting and inspection. Croatian Waters are also responsible for monitoring (data collection, processing and

evaluation) of the quality of (primarily surface). It does not deal with marine water. Formally, Croatian Waters submit the yearly plans for approval to the MAFWG but in practice the Managing Board make autonomous decisions and creates policies. The organization has county offices which carry water management in the field.

CROATIAN ENVIRONMENT AGENCY

The Croatian Environment Agency (CEA) is in charge of collecting and processing various gathered data on environment. It is also responsible for monitoring of environmental pollution, maintaining databases with environmental information and for providing the statistics needed for the reports on the national state of the environment. Since 2003, the CEA has been cooperating with the European Environment Agency (EEA) and submitting data to the European Environment Information and Observation Network (EIONET). The organization is soon expected to become a full member of the EEA.

CROATIAN AGRICULTURAL EXTENSION SERVICE INSTITUTE

The Croatian Agricultural Extension Service Institute (CAESI) is the main agricultural farm advisory service in Croatia. The organization is independent legal entity, but has to implement policy of the MAFWG. Currently the organization employs some 180 people and has regional offices in each county. The CAESI provides technical recommendations, instructions and practical examples of new technologies and management practices. It has also been active in publishing and production of various other extension materials. The rendered services are free of charge to all family farms.

CROATIAN SOIL INSTITUTE

The Croatian Soil Institute (CSL) performs a wide range of activities. It monitors the state of agricultural soils and assesses the degree of their pollution with undesirable, notably hazardous substances. The CSL also provides various expert advice services on soil, manure and fertilizer analysis, nutrient pollution control and integrated nutrient management. The organization has some fifteen staff and runs the laboratory for soil testing.

UNIVERSITIES

Both Faculties of Agriculture- in Osijek and Zagreb have departments dealing with various aspects of soil and water protection. This topic is also an integral part of their undergraduate and postgraduate curricula. There are several on-going research projects studying the relationship between agricultural production and soil and water pollution. Both faculties run own laboratories capable of performing various soil and water tests.

Technical requirements for materials

For both manure basement and above ground manure storage with a tank for liquid manure and rainfall preliminary calculations and design have been conducted according to the following legal existing and in force laws, regulations and standards as follows:

- ☐ Technical regulations for concrete constructions (TPBK; NN 101/05)
- ☐ Standard HRN ENV 1991 for the calculations and loads basis
- ☐ Standard HRN ENV 1992 for designing concrete constructions
- ☐ Standard HRN EN 206-1 for specifications, production and compatibility of concrete
- ☐ Standard HRN ENV 13670-1 for construction process of concrete structures.
- ☐ Standard nHRN EN 10080-1 for steel for reinforcing concrete.

According to listed regulations and standards, concrete to be used in described constructions has to be of minimum strength class C30/37 with minimum cement content of 300-320 kg/m³, maximum water cement ratio of 0,6; exposure classes: XC4, XF3, XA1 (50 year life expectancy of the structure). Concrete has to be waterproof and if needed (according to estimated sulfate concentration) sulfate resistant cement has to be used. Maximum aggregate size shall be 20 mm (otherwise known as 3 fractional concrete in Croatia).

Testing, compaction and curing of concrete should be done following listed regulations and standards.

Joints between upright walls and concrete slab must be constructed to ensure no leakage of manure and rainfall and to ensure requested durability. Sealing masses and sealing tapes are to be used.

Polypropylene fibers may be added into concrete mix to improve the properties of concrete. Only fibers that comply with the existing standards and regulations in Croatia may be used. Use of such fibers helps prevents and reduces plastic cracking and improves surface durability but they are not a substitute for structural reinforcement only possible regular concrete properties enhancement. This is an option that should be looked into with much care and in details and in strict compliance with standards and manufacturers if considered for using. Regarding Croatia, this still is not such a common technology and is not being used as much as regular concrete in the most of the constructing performed.

Reinforcement steel has to fulfill requirements listed earlier in this point. Reinforcement steel to be used is B500B Q (mesh reinforcement) and B500B R (bar reinforcement).

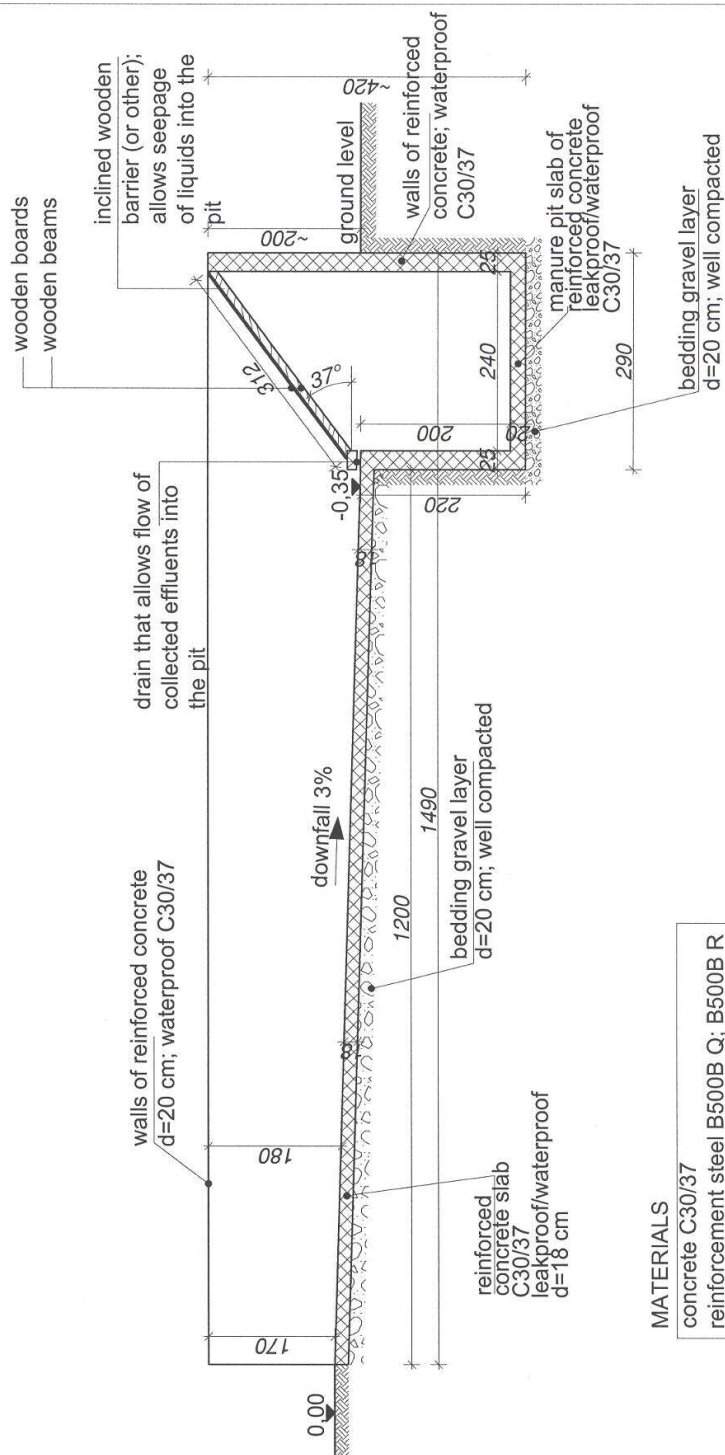
Concrete slab must be designed in such manner to bear loads from machinery loading and unloading manure.

Inclined wooden barrier described by the structure type 1 has to be properly impregnated with protection layer coating before installed in the construction.

Sample of the type1 manure storage for 20 cows is given on the following figure.

TYPE 1 MANURE STORAGE FOR 20 COWS

CROSS SECTION 1-1



App. 1.2

Monitoring wells are usually constructed to observe conditions at defined or required locations. Locations are usually selected on the basis of known or expected hydrologic, geologic, and water quality conditions and the location of pollutant or contaminant sources.

Monitoring wells frequently need to be located close to or within areas of pollution or contamination.

Monitoring wells should be located in areas protected from flooding, if possible and should be located an adequate distance from buildings and other structures to allow access for well maintenance, modification, repair, and destruction. The annular space should be sealed from the top of the filter pack or monitoring zone to ground surface. If a permanent conductor casing is to be installed, the monitoring well borehole diameter should be at least 4 inches greater than the outside diameter of the conductor casing. The inner diameter of the permanent conductor casing should in turn be at least 4 inches greater than the outside diameter of the well casing. Sealing material should consist of neat cement, sand- cement, or bentonite clay. Sealing material should be selected based on required structural, handling, and sealing properties, and the chemical environment into which it is placed.

The top of a monitoring well should be protected by a locking cover or equivalent level of protection to prevent unauthorized access and a casing should be fitted with a cap or "sanitary seal" to prevent surface water, pollutants, or contaminants from entering the well bore. A concrete base or pad should be constructed around the top of a monitoring well casing at ground surface and contact the annular seal. Protective casing serves to prevent accidental or intentional damage to a well. Protective casing normally consists of heavy gauge metallic pipe placed over the portion of the well casing that extends above ground surface. Special considerations that apply to monitoring well casing are: Casing Material, Multiple Screens, Bottom Plugs, Casing Installation.

Monitoring well development, redevelopment, and reconditioning should be performed with care so as to prevent damage to the well and any strata surrounding the well that serve to restrict the movement of poor-quality water, pollutants, and contaminants.

A monitoring well or exploration hole subject to these requirements that is no longer useful, permanently inactive or "abandoned" must be properly destroyed to: (1) Ensure the quality of groundwater is protected, and, (2) Eliminate a possible physical hazard to humans and animals.

