Environmental Management Plan for Romania Project
Environmental Impacts

Issues	Anticipated/Potential Environmental Impacts	Effects on Environment	Actions or Mitigation Measures
Surface water quality	Surface water quality will improve with the reduction in nitrogen and phosphorus transport to runoff waters from swine and cattle manure disposal sites, agricultural areas treated with manure and agricultural chemicals as better nutrient management practices will be implemented by the project. ii) Quality of drainage and irrigation canals that drain into Danube River will improve. iii) Overall effects on the quality of Danube river will be positive. **Probability of occurrence: High**	i) Increased quality and availability of Danube River water and Black Sea coastal waters will result in increased use of beaches by public and increased harvest of better quality fish ii) Increased utility of water for downstream users and fisheries if any. iii) drinking water supplies will improve and will have lesser health related effects for the city of Calarasi as it Danube River water for drinking supplies	i)develop and implement improved manure management and environmentally sound agricultural management practices in Calarasi County of Danube River watershed ii) Undertake a rigorous surface water quality monitoring program for Danube River and other surface water bodies that drain into Danube River to establish a baseline database of the quality of surface waters, lakes and Danube River as affected by better agricultural and manure management practices.
Groundwater	i) Reduction in nutrient leaching to groundwater quality will occur with the introduction of better manure storage and handling, and nutrient management practices will occur, ii) Quality of drinking water supplies will improve with the reduction of nitrate and bacteria in groundwater as a result of collecting manure from individual farmer's homesteads and storing in comuna platforms. **Probability of occurrence: High**	i) Increased quality and availability of groundwater for human and animal consumption ii) Groundwater is the main source of drinking for rural population and decreased levels of nitrate and bacteria in water will reduce water borne diseases in Calarasi region like nitrate poisoning. .	i) Implement environmentally sound agricultural and manure management practices in the project area. ii) Implement wellhead protection programs for rural drinking wells. iii) Establish extensive groundwater monitoring program in the highly intensive agricultural and animal production areas to determine the effect of better nutrient management practices. iii)Monitor groundwater quality in piezometers and wells in areas with improved agriculture and animal waste management systems
Soil Quality	With the introduction of better farming systems, soil quality will improve **Probability of occurrence: high**	Better productive lands with increased organic matter and carbon sequestration	Undertake soil monitoring of selected areas to establish the effect of better farming systems on soil and water quality
Biodiversity	Increased biodiversity will occur because of better manure management systems, introduction of conservation tillage systems, forest areas, buffer strips etc. **Probability of occurrence: high**	Increased biodiversity	Observe impact on new plant and animal populations, and soil worm and microbial activity. Measure effects on soil organic matter and carbon contents, and possibly water quality.

ENVIRONMENTAL MANAGEMENT PLAN
A. MITIGATION PLAN

1. Soil and Water Monitoring Program

(a): Manure Storage Facilities

			Cost	Institutional Responsibility	Comments (e.g. secondary impacts)
Phase	*Issue*	*Mitigating Measure*	*Install*	*Operate*	*InstallOperate*
Construction	· None				
Operation	· Manure leakage and water pollution	Proper engineering design according to British engineering design codes.	Included in the project	N/A	ContractorCountry Council and ComunaLoading and unloading of manure in the facilities will ensure proper manure storage
Decommissioning	· N/A				

B. MONITORING PLAN

						Cost	**Responsibility**
Phase	**What** *parameter is to be monitored?*	**Where** *is the parameter to be monitored?*	**How** *is the parameter to be monitored/ type of monitoring equipment?*	**When** *is the parameter to be monitored-frequency of measurement or continuous?*	**Why** Is the parameter to be monitored (optional)?	**Install**	**Operate Install Operate**
Baseline	**N/A**						
Construct	**N/A**						
Operate	Nitrate, phosphor-us, & Bacteria in soil & water	Piezometer and well sites & project activities sites	Using piezometers, wells, and soil samplers	Monthly	To detect if there is any N and P leakage to water bodies	Included in the project	Included in the projectEPIEPI and PHD
Decommission	**N/A**						

C. INSTITUTIONAL STRENGTHENING

1. Equipment Purchases (Tabular Presentation Preferred)
   (Justification is Included in the Project)

List:

Type of equipment
Number of Units
Unit cost
Total Cost
Local or International Purchase

Type of Equipment	Number of units	Unit cost	Total Cost	Local or International Purchase
Latchet Auto Analyzer for nitrate analysis	2	$35,000	$70,000	International
Centrifuger	2	$1,000	$2,000	International
Electronic Balance	3	$500	$1,500	International
Soil Samplers	4	$500	$2,000	International
Sampling Pump	2	$2,000	$4,000	International
GC Column	1	$850	$850	International
Electric. bath	1	$1,500	$1,500	International
pH Meter	1	$500	$500	International
Air Conditioner	4	$1,000	$4,000	International
Distilator	1	$2,000	$2,000	International
Refrigerator	1	$1,500	$1,500	International
Freezer	1	$2,000	$2,000	International
Agitator	1	$500	$500	International
Photo Spectro Meter	1	$4,900	$4,900	International
Water Samplers	2	$500	$1,000	International
Computers	4	$1,500	$6,000	International
Oven	1	$3,500	$3,500	International

2. Training/Study Tours
   (Justification is included in the project)

List:

Type of Training (Mitigation, Monitoring, Environmental Management, Other)
Number of Students
Current and Future Organizational Unit in Which They Work or Current and Future Title/Job Description
Duration of Training
Start Date/End Date (for each student)
Venue of Training (Domestic or Abroad)
Institute or Organization to Provide Training
Cost (Local and Foreign)

Type of Training	No. Students	Organization	Job	Duration (days)	Timings	Venue	Institute	Cost (local/ foreign)
Mitigation	1	EPI	Chemist	15-30	Yr.1	USA	ISU*	$5,000 foreign
Mitigation	1	EPI	Engineer	15-30	Yr.1	USA	ISU	$5,000 foreign
Mitigation	1	OJSPA	Chemist	15-30	Yr.2	USA	ISU	$5,000 foreign
Mitigation	1	EPI	Chemist	15-30	Yr.2	USA	ISU	$5,000 foreign
Monitoring	5	EPI	Eng/Ch.	5	Yr.2,3,4,5	ROMANIA	ICIM**	$4,000 local
Monitoring	7	EPI, OJSPA	Eng/Ch.	5	Yr.2,3,4,5	ROMANIA	ICPA***	$8,000 local
Environmental Management	1	EPI	Engineer	12	Yr. 1	USA	ISU	$5,000 foreign
Environmental Management	1	OJSPA	Engineer	12	Yr. 1	USA	ISU	$5,000 foreign
Environmental Management	2	EPI	Engineer	12	Yr. 2	USA	ISU	$10,000 foreig

* Iowa State University
** Research Institute for Environment
*** Research Institute for Soil and Agrochemistry

3. **Consultant Services**
   (details are included in the project)

   Type of Service: Environmental monitoring and Mitigation
   Terms of Reference: Provide monitoring and mitigation training, help in developing operational manual and implementing operational plans
   Justification: To help in building institutional capacity
   Cost: $5,000/yr

4. **Special Studies:** None needed

Justification:
Terms of Reference:
Cost:

D. SCHEDULE

Present (preferably in Chart Form) Start Dates and Finish Dates for:

Mitigation Activities:
Monitoring Activities:
Training Activities:

This information should be on the same chart defining the overall project schedule (Project Implementation Plan)

E. INSTITUTIONAL ARRANGEMENTS

Write a paragraph explaining on how things will be taken care of on Monitoring information, take mitigation actions, and make decisions on correction measures.

A narrative discussion supported by organizational charts detailing:

Responsibilities for mitigation and monitoring
Environmental information flow (reporting—from who and to who and how often)
Decision making chain of command for environmental management (to take action, to authorize expenditures, to shut down, etc.)

In short, how is all the monitoring data going to be used to maintain sound environmental performance—who collects the data, who analyzes it, who prepares reports, who are the reports sent to and how often, and who does that person send it to, or what does he/she do with the information—who has the authority to spend, shutdown, change operations etc.

Director of the Environmental Protection Inspectorate (EPI) in Calarasi would have the overall responsibility for environmental monitoring, mitigation, and performance. The Director of the EPI

will be certifying the construction of manure storage facilities and installation of piezometers for environmental controls. EPI Director has developed an implementation plan for soil and water monitoring and collecting and analyzing the data soil and water samples from various project activities. EPI field engineer will collect soil and water samples from the field on monthly basis (as discussed in the implementation plan) and will bring to laboratory chemists in the laboratories of EPI and PHD. Field chemist will analyze all soil and water samples and the field engineer and lab chemists together will prepare quarterly and annual reports and will send to the PMU/international consultant for evaluations. At the end of each year, soil and water quality data will summarized in usable form for the benefit of stakeholders including the World Bank, Ministry of Water and Environment, and other Black Sea countries. EPI will have the authority to shut down/change operations to facilitate the implementation of a mitigation plan in case leakage/breakdown occurs until things are fixed up.

* Iowa State University
** Research Institute for Environment
*** Research Institute for Soil and Agrochemistry

3. Consultant Services
(details are included in the project)

Type of Service: Environmental monitoring and Mitigation
Terms of Reference: Provide monitoring and mitigation training, help in developing operational manual and implementing operational plans
Justification: To help in building institutional capacity
Cost: $5,000/yr

4. Special Studies: None needed

Justification:
Terms of Reference:
Cost:

D. SCHEDULE

Present (preferably in Chart Form) Start Dates and Finish Dates for:

Mitigation Activities:
Monitoring Activities:
Training Activities:

This information should be on the same chart defining the overall project schedule (Project Implementation Plan)

E. INSTITUTIONAL ARRANGEMENTS

Write a paragraph explaining on how things will be taken care of on Monitoring information, take mitigation actions, and make decisions on correction measures.

A narrative discussion supported by organizational charts detailing:

Responsibilities for mitigation and monitoring
Environmental information flow (reporting—from who and to who and how often)
Decision making chain of command for environmental management (to take action, to authorize expenditures, to shut down, etc.)

In short, how is all the monitoring data going to be used to maintain sound environmental performance—who collects the data, who analyzes it, who prepares reports, who are the reports sent to and how often, and who does that person send it to, or what does he/she do with the information—who has the authority to spend, shutdown, change operations etc.

Director of the Environmental Protection Inspectorate (EPI) in Calarasi would have the overall responsibility for environmental monitoring, mitigation, and performance. The Director of the EPI

will be certifying the construction of manure storage facilities and installation of piezometers for environmental controls. EPI Director has developed an implementation plan for soil and water monitoring and collecting and analyzing the data soil and water samples from various project activities. EPI field engineer will collect soil and water samples from the field on monthly basis (as discussed in the implementation plan) and will bring to laboratory chemists in the laboratories of EPI and PHD. Field chemist will analyze all soil and water samples and the field engineer and lab chemists together will prepare quarterly and annual reports and will send to the PMU/international consultant for evaluations. At the end of each year, soil and water quality data will summarized in usable form for the benefit of stakeholders including the World Bank, Ministry of Water and Environment, and other Black Sea countries. EPI will have the authority to shut down/change operations to facilitate the implementation of a mitigation plan in case leakage/breakdown occurs until things are fixed up.

PUBLIC CONSULTATION

Consultation with Local NGOs and Project-Affected Groups

Provide documentation of the following:

Date(s) consultation(s) was (were) held: October 26, 2000
Location(s) consultation(s) was (were) held : DGAIA Office
Who was invited:

- Mayors of comunas Al. Odobescu, Ciocanesti, Cuza Voda, Gradistea, Independenta, Vilcelele and Vlad Tepes;
- DGAIA engineering staff;
- OJCA staff;
- OJSPA staff;
- EPI staff (technical and inspectors);
- PHD staff;
- Romanian Waters Regia, staff;
- Romanian Association for Sustainable Agriculture – NGO, 3 N. Titulescu street, Fundulea, Calarasi;
- Private farmers.

· Who attended
Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office)

- Gheorghe Sultan, mayor of Al. Odobescu comuna, tel: 094655295;
- Pavel Petre, mayor of Ciocanesti comuna, tel: 042/304927;
- Toma Gheorghe, mayor of Cuza Voda comuna, tel: 093251201;
- Iancu Florian, mayor Gradistea comuna, tel:092644084;
- Anghel Constantin, mayor Independenta comuna, tel: 094537341;
- Iliuta Vasile, mayor Vilcelele comuna, tel: 092260625;
- Vaideanu Cornelia, mayor Vlad Tepes comuna, tel: 092303357;
- Aurel Dobre, General Director DGAIA, tel: 042/332427
- Cristian Parapiru, DGAIA engineer, tel: 042/332427
- Anton Magearu, Director, OJCA, tel: 042/324020
- Luciana Grigoriu, OJCA engineer, tel: 042/324020
- Elena Marin, OJSPA Director, tel: 042/321028
- Ion Ciofu, Director, EPI, tel: 042311926
- Elena Georgescu, chief monitoring, EPI, tel: 042311926
- Aurel Ianos, chief inspector, EPI, tel: 042311926
- Silviu Pasare, inspector, EPI, tel: 042311926
- Viorel Roman, Director, Romanian Waters Regia;
- Camelia Truica, Deputy Director PHD, tel: 042/325285
- Maria Dragomir, private farmer, SC Agromimar, tel: 092381058
- Arnold King, PPU's international consultant;
- PPU staff.

· Meeting Program/Schedule

What is to be presented:

- Draft proposal for manure collection and storage system. Household level facilities and comuna storage construction – design principles, operating scheme, criteria for location selection.

- Equipment needs for collection, storage, composting and use of manure as fertilizer.

By whom:

- Phil Metcalfe, ADAS UK, consultant, manure component;
- Ion Toncea, ICCPT Fundulea, consultant, environment-friendly agricultural practices.

- Summary Meeting Minutes (Comments, Questions and Response by Presenters)
- Question:
- Silviu Pasare, inspector, EPI - How the liquid fraction of the manure will be managed?
- Answer:
- Phil Metcalfe – the liquid fraction of the manure and urine will be collected in special basin and, at the household level, will be periodically tipped over the waste heap using a bucket. The liquid not absorbed by the waste will return to the basin. At the comuna storage the liquid fraction and the rainfall will be collected into a basin.

Question:
- Gheorghe Sultan, mayor, Al. Odobescu comuna – Why it was proposed an over-ground construction. The Al. Odobescu comuna has a feasibility study for the manure storage facility and the solution recommended is a semi-submersed construction.

Answer:
- Phil Metcalfe – the depth of 4 m may not be suitable for sites with high water table and the drainage cannot be supplied for this type of structures. The partial submersion of the structures results in a basin for the collection of rainfall installed at a lower level with risks for high water tables. Also the cost of the construction of a submersed platform was considered by the civil engineer to be more expensive than a structure built on the surface.

Question:
- Constantin Anghel, mayor, Independenta comuna – Will the designed system provide for facilities (eg. Bins) for segregating the waste? How the recyclable materials are to be handled?

Answer:
- Ion Toncea, consultant – The project will provide facilities (cost sharing) for the farmers to procure bins and the storage structures, at the comuna level, will have separate bunkers for recyclable materials (scrap iron, glass, plastic).

Question:
- Cornelia Vaidean, mayor, Vlad Tepes comuna – If the platform will allow the storage of manure for at least 5-6 months?

Answer:
- Ion Toncea, consultant – The design was prepared for a 5 month storage period at the comuna platform and one month at the household level.

Question:
- Pavel Petre, mayor, Ciocanesti comuna – Except the household and comuna sanitation, would the collected manure have any value?

Answer:

- Phil Metcalfe, consultant – The main economic benefit from management of agricultural waste will be realized in the recycling of the nutrients in crop production. The manure can substitute the mineral factory produced fertilizers and the expected benefit is around 5 millions ROL/ha in a four years crop rotation.

· Date(s) consultation(s) was (were) held: October 30, 2000
· Location(s) consultation(s) was (were) held : DGAIA Office
· Who was invited:
- Mayors of comunas Al. Odobescu, Ciocanesti, Cuza Voda, Gradistea, Independenta, Vilcelele and Vlad Tepes;
- DGAIA engineering staff;
- OJCA staff;
- OJSPA staff;
- EPI staff (technical and inspectors);
- PHD staff;
- Romanian Waters Regia, staff;
- Romanian Association for Sustainable Agriculture – NGO, 3 N. Titulescu street, Fundulea, Calarasi;
- Private farmers.

· Who attended

Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office)

- Gheorghe Sultan, mayor of Al. Odobescu comuna, tel: 094655295;
- Pavel Petre, mayor of Ciocanesti comuna, tel: 042/304927;
- Toma Gheorghe, mayor of Cuza Voda comuna, tel: 093251201;
- Marin Dobre, vice-mayor Gradistea comuna, tel:092644084;
- Anghel Constantin, mayor Independenta comuna, tel: 094537341;
- Iliuta Vasile, mayor Vilcelele comuna, tel: 092260625;
- Vaideanu Cornelia, mayor Vlad Tepes comuna, tel: 092303357;
- Aurel Dobre, General Director DGAIA, tel: 042/332427
- Cristian Parapiru, DGAIA engineer, tel: 042/332427
- Anton Magearu, Director, OJCA, tel: 042/324020
- Luciana Grigoriu, OJCA engineer, tel: 042/324020
- Elena Marin, OJSPA Director, tel: 042/321028
- Ion Ciofu, Director, EPI, tel: 042311926
- Elena Georgescu, chief monitoring, EPI, tel: 042311926
- Aurel Ianos, chief inspector, EPI, tel: 042311926
- Camelia Truica, Deputy Director PHD, tel: 042/325285
- Arnold King, PPU's international consultant;
- Dana Dobrescu WB consultant;
- John Cole, consultant;
- Simon Turner, consultant;
- Ramesh Kanwar, consultant
- Local Press
- PPU staff.

· Meeting Program/Schedule

What is to be presented:

- Final proposal for manure collection and storage system (design and estimated cost of construction and operating).
- Monitoring Program

By whom:

- Phil Metcalfe, ADAS UK, consultant, manure component;
- Ion Toncea, ICCPT Fundulea, consultant, environment-friendly agricultural practices.
- Ramesh Kanwar, consultant, Water and Soil Quality Monitoring.

- Summary Meeting Minutes (Comments, Questions and Response by Presenters)

Question:

- Aurel Ianos, inspector, EPI – If the EPI staff will be trained for the Monitoring Programme?

Answer:

- Ramesh Kanwar – A special training program (international and local) will be provided by the project.

Question:

- Gheorghe Sultan, mayor, Al. Odobescu comuna – He agree with the proposed manure collection and storage system. How will be selected the first comunas for constuction of storage structures?

Answer:

- Stefan Nicolau, PPU Director – the PPU will develop criteria for selecting the comunas. These criteria will be used in consultation with the stakeholders, represented by a Local Coordination Committee to be established.

Question:

- Constantin Anghel, mayor, Independenta comuna – He agree with the proposed manure storage system. When the project will become effective? From his experience if the project effectiveness is delayed the peoples desire will decrease and also their support.

Answer:

- Stefan Nicolau – The project could become effective in September 2001.

Question:

- Cornelia Vaidean, mayor, Vlad Tepes comuna – If the platform will be fully certified by the EPI and PHD?

Answer:

- Ion Ciofu – The construction permit will be issued only if all the legal procedures will be followed. An environmental impact study and the permits for the local agencies (OCAOTA, PHD, Romanian Waters Regia, County Council etc.) will be required by the EPI before the issuing of the Environmental Permit.

Question:

- Iliuta Vasile, mayor, Vilcelele comuna – Who will be the responsible body for the manure storage facility operation and farmer's instruction?

- Answer:
- Phil Metcalfe – The overall responsibility will be at the comuna level. PMU and OJCA will provide support for farmer's instruction on collecting and handling of waste.

· Date(s) consultation(s) was (were) held: November 16, 2000
· Location(s) consultation(s) was (were) held : Calarasi County Council
· Who was invited:

- Mayors of comunas Al. Odobescu, Ciocanesti, Cuza Voda, Gradistea, Independenta, Vilcelele and Vlad Tepes;
- County Council engineering staff;
- DGAIA engineering staff;
- OJCA staff;
- OJSPA staff;
- EPI staff (technical and inspectors);
- PHD staff;
- Romanian Waters Regia, staff;
- Romanian Association for Sustainable Agriculture – NGO, 3 N. Titulescu street, Fundulea, Calarasi;
- FORDOC, NGO.
- Private farmers.

· Who attended

Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office)

- Gheorghe Sultan, mayor of Al. Odobescu comuna, tel: 094655295;
- Pavel Petre, mayor of Ciocanesti comuna, tel: 042/304927;
- Deculescu Dan, vice-mayor, Ciocanesti comuna;
- Toma Gheorghe, mayor of Cuza Voda comuna, tel: 093251201;
- Marin Dobre, vice-mayor Gradistea comuna, tel:092644084;
- Botea Chirea, secretary Gradistea comuna;
- Anghel Constantin, mayor Independenta comuna, tel: 094537341;
- Iliuta Vasile, mayor Vilcelele comuna, tel: 092260625;
- Iacob Razvan, technician, Vilcelele comuna;
- Vaideanu Cornelia, mayor Vlad Tepes comuna, tel: 092303357;
- Adela Sprinceana, agricultural specialist, Vlad Tepes comuna
- Anton Magearu, Director, OJCA, tel: 042/324020
- Ion Nabirgeac, Director OCAOTA;
- Ion Ciofu, Director, EPI, tel: 042311926;
- Marin Atena, specialist PHD, tel: 042/325285;
- Mihai Arbagic, President, Calarasi County Council, tel 042/311301;
- Marin Dragan, vice-president, Calarasi County Council;
- Adrian Lascar, chief architect, Calarasi County Council;
- Bratu Mihaela, specialist Calarasi County Council;
- Marin Silvia, specialist Calarasi County Council;
- Rodica Virtejanu, specialist Calarasi County Council;
- Costea Elena, specialist Calarasi County Council;
- Simon Doina, specialist Calarasi County Council;
- Lucica Bogdan, specialist Calarasi County Council;
- Irina Ravac, FORDOC, NGO;
- Ion Toncea, consultant;

- PPU Director.

· Meeting Program/Schedule

What is to be presented:

- Final proposal for manure collection and storage system (design and estimated cost of construction and operating).
- Setting up the Local Project Coordination Committee.

By whom:

- Stefan Nicolau, PPU Director;
- Ion Toncea, ICCPT Fundulea, consultant, environment-friendly agricultural practices.

· Summary Meeting Minutes (Comments, Questions and Response by Presenters)

- Comments:

- Anghel Constantin, mayor, Independenta comuna – He totally agree with the proposed solution for the manure management. He wants to know which will be the role of the Local Coordination Committee.

Answer:

- Stefan Nicolau, PPU Director – the role of the Coordination Committee will be to express opinions regarding the project yearly budget, proposed action plans and contracted agencies. The Project Coordination Committee will also be consulted on the selection criteria for comuna selection.

Question:

- Gheorghe Sultan, mayor, Al. Odobescu comuna – He agree with the proposed manure collection and storage system. If between the selection criteria there are ones related to the comuna commitment for other project components as agro-forestry?

Answer:

- Stefan Nicolau, PPU Director – the PPU will develop criteria for selecting the comunas. These criteria will be used in consultation with the stakeholders, represented by the Local Coordination Committee to be established. The comunas participation in the agroforestry program will be a main condition for selection to receive support for manure management.

Question:

- Constantin Anghel, mayor, Independenta comuna – He agree with the proposed manure storage system. Will the County Council support the comunas for obtaining the construction permits?

Answer:

- Mihai Arbagic, President of the County Council – The chief architect will prepare a schedule for the required actions needed for issuing the Urban Certificate. He estimates that all certificates could be issued before the end of the year 2000.

Question:

- Cornelia Vaidean, mayor, Vlad Tepes comuna – If the EPI will request a tax for the issuing of the Environmental Permit

Answer:

- Ion Ciofu – The construction permit will be issued only if all the legal procedures will be followed. An environmental impact study and the permits for the local agencies (OCAOTA, PHD, Romanian Waters Regia, County Council etc.) will be required by the EPI before the issuing of the Environmental Permit. According to the law the comunas will have to pay a 1,000,000 lei tax.