

ENVIRONMENTAL ASSESSMENT

SUPPLEMENT

CARGILL SEED PRODUCTION AND PROCESSING PROJECT

BESHEVSKY FARM, DONETSK OBLAST, UKRAINE

Under the auspices of

Citizens Network for Foreign Affairs, Kiev, Ukraine

and the

United States Agency for International Development

Cooperative Agreement No. 121-0006-A-00-6238-00

Agribusiness Partnerships I Project

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Prologue

This Environmental Assessment Supplement is submitted by Citizens Network for Foreign Affairs to the United States Agency for International Development upon approval of Cargill Seed Company as fulfillment of the requirements of 22 CFR Regulation 216, and recommends final approval by USAID as the final Environmental Assessment documentation for the sub grantee of this Agricultural Partnerships-1 Project in Ukraine. The Supplement answers specific previous questions of AID regarding earlier environmental studies of the project and updates the project activities. The Supplement also collates all communications to date under one cover for convenience to all parties.

(1) SUMMARY

The Cargill Seed operation in Beshevsk, Donetsk, which was originally partially funded from the Food Systems Restructuring Project (110-0006), is on line and expanding rapidly. Cargill has submitted an extension proposal for their project through the end of the AP-1 Project, 31 December, 1997 which will include sunflower production using herbicides and minimum tillage techniques. This project is a joint venture between Cargill and the Beshevsky Farm known as Cargill AT. The purpose of this project is to enable farms to improve grain yields by providing adapted genetics, construction of a seed processing facility, and to set up a distribution network with which to market agricultural inputs.

The Cargill Seed facility in Beshevsk is well constructed (Appendix D) and the plant is operating in a safe, efficient, environmentally benign manner. The environmental parameters of air and water pollution are minimal or non existent. The transportation network in the region is under utilized. The seed facility is located in a rural area. It consists of storage bins, cleaning equipment, sizing and bagging equipment, a seed

treatment area and warehouse where the final products are stored. Noise and traffic from the operation will not interfere with daily living. This facility also includes a laboratory, which tests for moisture and germination of the seeds that are delivered to the plant. The laboratory is small, and the nature of its activities are not degrading to the environment. Cargill Seeds has assured good maintenance of the plant and there are obvious warning signs and safety equipment in all sensitive areas (Appendix D - Photo Album). As a result of a comprehensive recent internal safety and environmental review, Cargill is installing additional cage railings on outside storage bins, remodeling stairs and doorways. Cargill has implemented a worker safety plan for its employees (Appendix C).

1.1 Mitigations and Recommendations

- a) Cargill needs to provide quantitative evidence in the final quarterly report of the warehouse, seed processing and varietal demonstration plots, of worker safety training in the rational use of pesticides.
- b) Cargill should practice Integrated Pest Management in selection of herbicides and other pesticides, e.g. Goal herbicide versus other herbicides on their menu used in seed production and varietal trials. This is particularly important since at least one herbicide is a suspected carcinogen and should only be used in emergencies.
- c) Cargill should review previous mitigation requirements attached as Appendices to this supplement to assure compliance with contractual agreements.

1.2 Status of Environmental Assessment Process

The Project received USAID funding in July, 1993. The Initial Environmental Evaluation for the Cargill Seeds project was written by Loreta Williams, PSI/NIS/TF and Renee P. Wynn, EET/NIS/TF with a Positive Determination (No dates on CNFA copies). CNFA offices have no evidence that the IEE was approved, but assumes that it was. A Scope of Work (Appendix A) was written by Mark Mitchell of CNFA. This was submitted to USAID, but no documentation exists as to authorization by AID. CNFA continued the process, preparing an Environmental Assessment contracting Inter Connect Associates, Inc. to do the work. A final draft dated November, 18, 1994 was submitted to CNFA and then to USAID. David Smith of USAID reviewed and rejected the document on 25 January, 1995 and included some suggestions for improvement. These recommendations were to ?articulate clear environmental management practices to avoid future operation-related impacts to environmental health and safety.? In addition, Mr. Smith inquired about AID-purchased pesticides, an emergency preparedness plan, and future activities to expand the model center or construction of other facilities. CNFA submitted an EA Supplement Draft dated January, 1996 written by Mark. C. Mitchell, former Environmental Officer for CNFA. Clearly, the Supplement answered AID?s inquiries. On June 20, 1996, Marshal Fisher, ENI/EEUD/ENR rejected the document again, giving some suggestions. A letter from Marcus Winter/USAID to John Balis/CNFA dated 9 July, 1996 inferred why the Supplemental EA was rejected by

USAID. The letter was quite general, and described some of the concerns and listed recommendations for subsequent Environmental Assessments. The concerns were:

- 1) EA process should be open and participatory
- 2) Claims of confidentiality must be defensible
- 3) Environmental documents do not clearly define projects and partnership roles
- 4) Examination of alternative actions
- 5) Buy in by the agribusiness partner
- 6) Environmental consideration as part of grant selection criteria.?

In this present Supplemental EA, these criteria are discussed, even though numbers 2, 3, 4, and 5 are thoroughly described in Cargill's original proposal and quarterly reports. This EA Supplement was written because no information exists that final environmental approval by USAID occurred, and CNFA wishes to address all AID inquiries formally pursuant to compliance with 22 CFR Regulation 216. There were other correspondences about this matter as well. The IEE and other environmental documents are attached to this supplement as Appendices.

The Authors of this present Environmental Assessment Supplement assumed that the tenants of the Scope of Work were valid. The Supplement EA was carried out from August to October, 1997 in Kiev and Novozariievka village, Beshevsky farm, Donetsk Oblast, Ukraine by Dr. Wayne T. Williams, Environmental Officer of CNFA/Kiev, Lena Lopantseva, M.S. Environmental Assistant, CNFA and staff. After two trips to the site in the Donetsk Oblast visiting several farms in the region, and having several interviews with the Cargill staff, the Supplemental EA was completed

Since the September, 1994 EA was conducted, the project has significantly changed direction. These changes were not discussed with CNFA environmental officer by Cargill *a priori* as witnessed by a lack of notification in CNFA/Kiev files. Funding now is primarily used for the technology transfer of corn, and sunflower seed production and the processing of hybrid sunflower seed. Project emphasis has switched away from the Central Maize Institute in Dnipropetrovsk developing new corn genetics to a seed processing plant in Novozariievka (Beshevsky farm) in Donetsk Oblast. The facility is undergoing a large expansion. Cargill failed to advise the CNFA environmental office of these activities, although when CNFA inquired about the changes, Cargill was very cooperative providing all information requested.

(2) PURPOSE

The purpose of the project is to introduce modern seed genetics and technologies, thereby providing alternatives to the Ukrainian State seed sector. This project is a joint venture corn and sunflower breeding program where improved and better adapted varieties will enable farmers to obtain improved yields. The new genetic varieties developed will be produced through contract production with farms. Cargill has invested in a new sunflower seed processing facility ensuring good quality and uniform planting seed. They will train farmers and sprayer technicians in Ukraine, providing alternatives to the State distribution system. Farms will pay with part of the increased crop yield. Cargill will provide a marketplace for corn and sunflower production, increasing the income of the farms and resulting in more incentives to join the open market system as it develops in Ukraine.

The project will target large and small private farms in different Oblasts of Ukraine, mainly in Donetsk, Kirovograd and Cherkassy regions. At present, they have about 500 customers, including 33 small private farmers. Cargill seed division is working in close cooperation with the Cargill Grain, Sugar and European Oil Processing Division in its barter operation. Thirty percent of their activity this year was in the form of barter.

(3) DESCRIPTION OF THE PROJECT- REVIEW

Cargill, Inc. is establishing a new seed marketing unit in Ukraine. This is in the area of seed research and a production project with integrated marketing, handling and processing systems.

The Cargill Seed facility is located on the Beshevsky farm east of Donetsk in Donetsk Oblast, Ukraine. The facility is bounded by agricultural fields on the south and east sides. The north side is occupied by the grain storage and handling facility of Beshevsky Collective. To the east are livestock buildings which house cattle and pigs. Also to the east is a well reported to be abandoned and a water tower that is still in use. The immediate property is surrounded by a two meter high concrete fence and electric steel service doors with guards are present.

The seed processing facility is constructed with a combination of steel and masonry structures. The seed processing area and the scale house are corrugated steel, the laboratory and employee rooms are brick masonry, and the main storage area is pre-formed concrete with an asphalt floor. The facility was built in 1995. Work is underway on the construction of a new warehouse while insulation is being added to the existing warehouse. The plant has the capacity to clean 10 tons of seeds or treat 4.5 tons of seeds per eight hour shift. In 1996-1997 they treated 700 tons of sunflower seeds. Cargill also provides for the sale of agricultural equipment such as planters and sprayers to the farms which produce seeds for the plant. This year they sold 49 sprayers and 40 planters to farmers in Ukraine.

The seed processing facility is designed to clean, sort, treat, bag and store 1,000 metric tons of sunflower seeds per year. The majority of the activities occur within a two month period each fall. The distribution of seed, occurs in the winter and early spring with practically no activity taking place during the summer months.

Sunflower seeds are brought to the facility after harvesting where they are weighed and transferred to four 24 MT steel bins. Via bucket elevators the seed is passed through a cleaner which removes foreign matter and dust. The cleaner operates at one MT/hour. A dryer holding a 18 MT load reduces seed moisture. The next process is sizing and length sorting followed by the specific gravity table for additional uniformity to the final seeds. Seed that has passed through the sorting and cleaning process is now ready for chemical treatment. A slurry is mixed from three preparations: Apron 35SD fungicide, Actellic insecticide, and Separate sticker-adherent. The seed is mixed with this slurry and dried. It is now ready for the final bagging.

3.1 Building Site

Construction of the seed processing facility involved the development of a 1.5 hectare (ha) former greenhouse site. The level topography of the area enabled construction to take place with very little movement or removal of soil. A large portion of the 1.5 ha remained undisturbed during construction. The warehouse expansion is now utilizing most of the site.

3.2 Site Access

The public road passes within approximately 100 meters of the facility and adjoins the site. This road was graded and paved with asphalt to provide site access.

3.3. Genetic Integrity

Based on the test results of new corn hybrids (*Zea mays*) bred by Joint Venture Cargill Seed, the following corn hybrids passed to the State Variety Commission Program:

KADR 327 MV (good heat and drought resistance; important for Ukrainian climate)

KADR 397 (yield potential and drought resistance)

KADR 413

KADR 447

Corn Hybrid KADR 397 is registered in Ukraine and produced by Cargill for sales in 1997/1998. Next season they will try for State registration of 4 more corn hybrids bred by Joint Venture. More than 30 early maturity hybrids have been identified for their breeding program.

Dr. Andrew Scinski, the breeding co-ordinator from Cargill Inc., USA, has visited the research facilities twice within the past 4 months. He checked the condition of all the screening tests, both in JV and Cargill Research Station. The Station itself is located

farther to the north than the JV plots, which will allow the breeding of early maturing hybrids in more acceptable conditions. Cargill rents 13 ha of irrigated land. The staff consists of 1 corn breeder, 1 Research System Information Assistant, 2 technicians, and 2 clerical personnel. There is also an extensive material exchange program of sunflowers with 3 Ukrainian breeding institutes.

3.4 Screening Program

The objective of the preliminary screening trials is to identify the most genetically adaptable material for local conditions that is available from Cargill world-wide before applying for State Registration. There are 135 sunflower and 72 corn hybrids in 10 regions of Ukraine being tested. The tests are being conducted in varying research institutes and stations of the State Variety Commission. In comparison with last year, the volume is almost doubled. Also being tested are *Orobanche* and *Phomopsis* resistance in sunflowers and early maturing corn. Rapeseed is also being tested as it is an important alternative to sunflower as a source of vegetable oil.

3.5 Strip Trials and Agronomy Service

There are also 16 demonstration plots in the 10 regions. Cargill is supplying the seed and herbicides, organizing the data collected from the 16 fields, assisting with Field and Agronomy Days and providing technical training for the farm specialists. The majority of these demonstration farms also have commercial fields of 500 ha or more planted with Cargill hybrids .

3.6 State Trials

The State Variety Commission report lists the following Cargill hybrids that have been registered in Ukraine:

Sunflower

Optisol - Permanent Register

Turkuaz - Prospective Register (needs one more year of testing, but has a permit to sell)

Adalid - same

SF 187 - same

Corn

C 3427 - Permanent Register

C 4277 - same

Fifteen sunflower and 2 hybrid corn varieties will be added to the State Trials Program this year. Not only will they be included with the standard testing, but they will also be tested for disease resistance. A large variety of tests are coordinated locally by Alexander Matienkoo, Cargill Technical Manager. On a worldwide level the tests are coordinated by Didier Raillard for corn (Cargill France) and Al Jarvi for sunflowers (Cargill USA).

(4) SPECIAL CONCERNS OF USAID

4.1 Pesticides

This section is presented in an abbreviated form because USAID funds were not used for the procurement of the pesticides listed in this report. However, USAID requested that this section be included in the EA. All of the pesticides listed were purchased in Ukraine and subsequently have passed through that country's testing and registration process.

Three overall objectives were considered for the selection of all pesticides in the Cargill program: 1) lowest rate of application, 2) safety in handling and, 3) regulatory considerations. All chemicals selected are registered in both the U.S. and in Ukraine. The project supplies the field spray workers with personal protective equipment. The Emergency Organization Plan for handling chemicals, guidelines for applications, personal protection and spill clean up is attached in Appendix C.

Under the current conditions in Ukraine, a number of pest controls are used. Several western chemical companies are now represented in Ukraine and comprise the majority of the plant protection chemicals sold. The chemicals used by this project were purchased (with non-USAID funds) from these companies within Ukraine.

The State Interdepartmental Commission on Trials and Registration of Plant Protection Products, Growth Regulators, and Fertilizers is a new institution which has been created to register pesticides in Ukraine. The old structures in the Oblasts and rayons, the Plant Protection Stations and the Sanitation and Epidemiology Service, have retained the authority to regulate transport, storage, and application of pesticides and fertilizers.

4.1.1 Sunflower Seed Treatment

The seed processing facility is located on the outskirts of a rural, agricultural village. Pesticide use at the facility is limited to the treatment of sunflower seeds inside the building. Farmers are trained by Cargill on the safe handling of treated seed during transport, storage and seeding operations. In seed treatment, the thin layer of pesticide around each seed protects it in the soil, and there is little movement of pesticides away from the seed itself. The adherent provides for a bonding between seed and pesticide, inhibiting movement. The amount of pesticides surrounding the seed in the ground has been determined to be the correct dosage for target pests.

Two pesticides are used for seed treatment. ?Apron,? a formulation of metalaxyl, is a systemic fungicide seed dressing specifically for the control of downy mildews and diseases caused by soil-borne *Pythium* and *Phytophthora*. For control of other soil and storage pests it should be applied in combination with other seed dressings, such as Actellic. ?Actellic,? a formulation of Pirimiphosmethyl, is effective against a wide range of pests during seed storage. This broad spectrum, contact insecticide also has a fumigate effect.

Table 1: The EPA Registration Status of the Pesticides Used in the Seed Processing Plant

Pesticide Name	EPA Registration Category	Crop Use
Apron (Metalaxyl) Fungicide	General use	Seed treatment
Actellic (Pirimiphos-metyl) Insecticide	General use	Seed treatment

Both of the chemicals listed are available locally from recognized manufacturers which have proven effectiveness. The chemicals are Class II (Warning) and Class III (Caution). Seed treatments with Apron and Actellic are considered to be necessary in varietal trials and for profitable yields and are a traditional, reasonably safe technique within the context of Integrated Pest Management.

A separate treatment room is used to prepare a water based slurry of the two chemicals, a red-purple dye and an adherent (Sepiret 07- cellulose alkile, plastifier, natural aluminum silicate, titanium dioxide). This slurry is then mixed in a stainless steel tank (Appendix D) with the seed, quick dried and packaged. The slurry room is adequately marked with signs warning about the pesticides (Appendix D - Photo Album).

All effluent from seed treatment activities is emptied into a closed system consisting of a cement tank with a locked steel cover guarded by curbing on the exterior of the building. To date, Cargill has not had to empty the storage container, but arrangements have been made with Monsanto for proper disposal.

Due to the technology portion of this project, on-going monitoring of pesticide application and effectiveness is frequent. Seed production activities are reported on a quarterly basis to CNFA, and with the implementation of this annual environmental audit more detailed information is obtained and reported.

Table 2: The EPA Registration Status of Pesticides Used in Seed Production Fields and Demonstration/varietal Trial Plots

Pesticid	Personal Protective Level	Acute Oral Bird LD ₅₀ ³ (Mg/kg)	EPA Toxicity Category	EPA Signal Word	EPA Registration Status
Fungicide Apron (Metalaxyl)	2	669 (MT)	II	Warning	Conditional Use

Insecticide Actellic (Pirimiphos-metyl)	3	2050 (ST)	III	Caution	Conditional Use
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Table 3: Technical Specifications of Herbicides for Cargill Seed Project. *

Product Name	EPA Registration	EPA Toxicity Category				Personal Protective Equipment & Handling	Environmental Indicators				
		Oral	Inhalation	Dermal	Eye		Fish LC50	Bird	Leaching	Absorption	Carcinogenicity
Harness (H) (Trophy-Aceto-chlor)	Restricted Use	III		II	I	I	377 mg/l	50 mg/l	M	S	
Treflan	Conditional Use	IV				III	MT	PNT	S	L	
Dual (Metolachlor)	Neither	III	IV	III	IV	II		PNT	L	M	
Goal (Oxyfluorfen)		IV		IV			HT	PNT	S	L	EPA Lists as possible human carcinogen

* Treflan was the only herbicide used on production fields.

4.1.2 Pesticide Use in Genetic Testing Program

The project supplies the field spray workers with personal protective equipment. (See the Emergency Organization Plan for handling chemicals, guidelines for application, personal protection, and spill clean up).

The herbicides used by the project are considered to be essential for production and are reasonably safe in agricultural projects when used according to manufactures directions and contained properly (Appendix G). Cargill employees receive instruction on the safe use of these chemicals.

During the testing of genetic lines and commercial seed production, various pesticides are used, including 4 herbicides and one fungicide (Tables 2 and 3). Toxicity indicators following IPM principles where least toxic, lowest environmental indicators exist were examined. Of the 4 herbicides, Goal, or oxyfluorfen, is a possible human carcinogen, and is highly toxic to fish and therefore should not be used when other less toxic herbicides are available. Of the 4 herbicides used, Treflan appears to be the least toxic, and therefore most recommendable. Cargill only used Treflan on commercial production fields. Harness, Dual and Goal were only used on a small test plot where inbred lines were tested for phytotoxic effects. Goal will not be used on production fields since it is phytotoxic to the inbred lines.

Corbel fungicide, a BASF product, is applied twice a year on sunflowers for the control of *Phomopsis* blight. It is regulated to doses of 0.5 - 1.0 liter per ha. The

fungicide is toxic to fish, but not dangerous to bees and birds. It is not irritating to rabbits eyes, and is not too soluble. It is able to be mixed with herbicides. More technical specifications are listed in Appendix G.

4.2 Project Expansion

Cargill significantly expanded its facility this year. The company brought in its corporate environmental safety officer to assess the worker safety and environmental mitigations needed. These suggestions were adopted by Cargill. Beyond the recent expansion, no new construction will occur during the lifetime of the project and USAID funds were not spent for these activities. As remodeling occurred in the seed treatment room, the floor which was covered with spilled pesticide and dye (see photo, Appendix D) was jack hammered away creating a hazardous dust situation.

4.3 Scope of AID Funded Activities

The lifetime of the Cargill Seed project is 54 months. AP-1 terminates on 31 December, 1997. USAID funded \$2,688,308 for the Cargill project of which 46% was for labor and fringe benefits, 16% was for travel, 32% was for communications and salaries and 5.5% was for supplies and equipment (Table 4). USAID specifically did not pay for pesticides nor construction, but indirectly paid partially for the supervisory labor needed to correctly use the pesticides and perform the construction. Therefore, USAID has a legitimate claim for mitigation requirements during the project. However, a lack of communication between all parties during transition of Cargill objectives in the seed project, from USAID during the switch from AP-1 to AP-2 projects and CNFA changes in staff and offices, failed to follow the mandates of the IEE where ? Approval of follow-on activities shall be based on the recommendations of the EA.? No available written communications were made from any of the parties about future construction in relation to environmental impacts, and no attention was paid to the IEE requirement that ?No construction can commence ...without the approval of the EA.? Further and closer guidance from USAID should have occurred. Cargill should have had been more proactive in advising AID and CNFA of its activities, and CNFA should have been more attentive to field activities of the field aspects of the project. Thus, Cargill?s environmental policy prevailed. They were sufficiently attentive to correct environmental procedures with conscientious managers on this project.

Table 4: Proposed Expenditures for the Cargill Seed Project

Category	AID	Total
1. Direct Labor	\$1,256,22	\$2,090,073
2. Fringe Benefits	\$14,737	\$394,730

3. Supplies & Equipment (Total)	\$149,606	\$4,573,921
3.1. Equipment U.S. Source	\$4,613	\$1,512,987
N.I.S. Source	\$80,131	\$2,198,480
3.2. Office Supplies	\$43,199	\$239,669
3.3. Other	\$21,663	\$622,817
	\$417,412	\$882,096
4. Travel and per diem		
5. Other direct costs	\$850,329	\$3,909,261
5.1. Communications		
5.2 Other		
N.I.S. seed manager		
Production expat		
Country manager		
HRD Manager		
NIS Seed Acct mgr		
Controller		
TOTAL PROJECT COSTS	\$2,688,308	\$11,850,081

4.4 Response to Correspondence from USAID Regarding EA Process

In the Cargill Seed project, the EA process was open and participatory, and no confidentiality claims were made to date. This Environmental Supplement lists specific expenditures for AID and Cargill. No alternative Actions were possible, since the *a priori* decision had been made about site and design, and alternatives to the actual activities were taken prior to USAID/CNFA involvement. The decision to change from maize to sunflowers by Cargill is not considered to be environmentally detrimental. The change is within their core business activities, and was a function of market pressures and climate. The project, as it exists, would have been the most logical choice for this kind of activity under Ukrainian conditions. In terms of Buy-Ins from the Agribusiness partners, as in other AP projects, the Ukrainian partners many times provide in-kind values such as land, buildings, other infrastructure and labor. In a 1997 memo from Jay Bjerke of Cargill to W. Riley of CNFA, Cargill explains that it is dealing with its farmer partners (clients) in a barter fashion. In 1997 Cargill paid out to growers about one million dollars for growing 1,100 MT of sunflower seeds via fertilizers, seed, herbicide, petroleum and equipment. Cargill receives a basic crop harvested, and sells it to run the next cycle. As far as is known, purely environmental factors were not overriding criteria of site choice nor kinds of activities for the project. Cargill's environmental policy was carried out well on this project.

(5) AFFECTED ENVIRONMENT

5.1 Description of the Environment

The Donetsk Oblast is located in eastern Ukraine and is the most heavily populated

part of the country. Major resources of coal, iron ore, and petroleum exist in the Oblast. The plethora of heavy industry such as coal mining, coal fired power plants, iron smelters and foundries, chemical factories, oil refineries, metal smelters, heavy appliance and aircraft factories etc. make Donetsk the combined Pittsburgh and Gary of the Ukraine. The area was infamous for its heavy acidic precipitation covering most of the eastern region in Soviet times. The current economic turmoil and inactivity in Ukraine is reducing air and other kinds of pollution. Many plants and industries lie idle or at very reduced production capacity, including agricultural production. Unemployment is very high, perhaps more than 50%. The Chernobyl atomic power plant meltdown of April 1986 and perhaps other nuclear facility leakages caused radiation contamination of the Donetsk Oblast (Appendix E), with at present, unknown agricultural consequences.

5.1.1 Physical Environment

The region is topographically broken with huge mounds of coal and limestone mine tailings that break the relief with cone-shaped mini mountains appearing similar to volcanoes and mesas.

Agriculturally, the Donetsk Oblast has the potential to be wealthy. Extensive planting of wheat, sugar beets, corn, sunflowers and soybeans cover vast acreage. The soils tend to be black chernozems, or of lighter grey yellow parent materials. Agricultural lands in Donetsk are concentrated in Priazovsko-Prychernomorskiy and Donetsk on high steppes or plains. Center pivot irrigation is present in some Rayons.

Geographical relief in the Oblast is flat, from sea level at the Sea of Azov, through low rolling hills and gentle valleys to the highest hill at 367 meters above sea level in the Donetsk hills (Iryaghe) and the lower Azov Hills. For the most part, the land is devoted purely to agriculture, but is punctuated by occasional plantations of hardwoods used for green open space, fire wood and some lumber and recreation. Natural landscapes are classified as agricultural lands, flood plains, deciduous forests, meadow-marshlands, various pools, ponds, small lakes, higher elevation forests, steppe landscapes with ?ordinary? chernozems of black earth, slopes and gullies. Around the villages are extensive individual gardens, where a large variety of vegetables and fruits are cultivated.

Important waterways are the Kalmius River which flows through Donetsk, to empty into the Sea of Azov, and the Silver Donets River, which flows east to Russia. Climate is temperate, ranging from about 47-49 degrees latitude north and about 36 degrees longitude east. The winter is medium in length with mean winter temperatures between 4 and 6 degrees Centigrade, with lows of -34. High temperatures can reach 40 degrees Centigrade. Precipitation ranges between 350 ml and 675 ml. annually. Soil types are relatively uniform, being almost all chernozem types.

5.1.2 Biological Environment

The native vegetation has almost been completely replaced by agriculture. The native fauna has been almost eradicated by habitat removal and hunting except for domestic species and some common vertebrates. Of particular interest botanically in Donetsk are those plant communities growing on rocky out-croppings and vegetation of limestone exfoliations. A complex of wild flowers, forbs, herbs and grasses exists in many of these locations. A profusion of remnant species exist from the past glacial age. There are some remnants of the Southern European deciduous forests, and ravines and gullies may be full of oaks. Habitat fragmentation and destruction by agriculture has caused a large number of rare and endangered species to be present in the Donetsk area (Appendix F).

In terms of fauna, in cities and their immediate surroundings, the following species are common; wild cats and dogs, turtle doves, black rats, white storks, blue-grey colored doves, pigeons, Syrian woodpecker, house martin, little house owl, black thrush, blackbirds, chaffinch (*Athene noctua*) and others. Around weirs, dams, and mill ponds are musk rats, beavers, otter, European and American mink, white tailed eagles, chicken hawks (hen harrier) and marsh harrier, plus different species of hawks. Several kinds of herons, (big, small, white, red and others) gray geese, fox, water hens (coots), stint magpie, sand pipers, small striped woodpeckers, titmouse, whiskered calidris, marsh turtles, green lizards, multicolored lizards, water-snake, ordinary adder (viper), steppe viper, two kinds of tritons, grass toads and others.

In ravines and the forests of the steppe are spotted deer, foxes, hawks, pheasants, big eared owl, small striped woodpecker, magpie, rook, green lizard, and grass-snake. On agricultural lands dwell field mice, grey hamsters, steppe cranes, larks, and partridge.

5.2 Waste Production

Waste is managed satisfactorily at Cargill. Torn bags, and other refuse is disposed of in the community landfill, and is minimal. Broken pallets are used for firewood. Agrichemical containers are given to Monsanto. Table 2 describes the seed waste.

Table 2: Estimated Waste Quantities Based on 1 Metric Ton of Sunflower Seed

Waste	Quantity per 1000 kg	Annual Total 1000 MT
Unusable Discard	140 kg	140,000 kg

Usable Discard	100 kg	100,000 kg
Dust	6kg	6,000 kg
Solid Waste	5kg	5,000 kg

Usable discard is rejected untreated seed which is then sold to an oil extrusion facility for further processing. Dust and unusable discard are combined and applied as organic fertilizer. Solid waste is deposited in landfills. The mix tank used for preparing the seed slurry is only cleaned once at the end of the two month season. This rinseate is discharged into a septic system on the site which has an additional sediment chamber. This system also handles and stores the sanitary sewage discharge from the facility. The system will be emptied as needed and applied on the land for final disposal. This septic system is separate from the holding tank for agrochemical seed treatments. Cargill does not allow treated seed to enter the food chain.

5.3 Land and Water Issues Related to the Use of Pesticides

This topic has been discussed in detail in the GAME EA submitted to USAID/Kiev on 8 October, 1997. Appendix G lists toxicity and use specifications for project pesticides and, if used according to instructions, should have only minimal negative environmental effects.

5.4 Air Emissions and Noise Levels

5.4.1 Air emissions will occur from combustion products from truck and automobile traffic in and out of the plant, skip loader activity within the warehouse and around the property. The majority of the plant is unheated. The office and lab areas are heated by electricity. There is no natural gas on the premises.

5.4.2 Noise will arise from the activities. These noises are not obtrusive to the local population which is several kilometers away.

(6) POTENTIAL IMPACTS OF TRANSPORTATION

No negative impacts from transportation are foreseen.

(7) EFFECTS OF FACILITY ON AESTHETICS AND VISUAL QUALITY

The facility is not visible from the village and is of satisfactory aesthetic standards. There is a grove of deciduous hard woods such as oaks, basswood and black locust planted along the road.

(8) ENVIRONMENTAL CONSEQUENCES

The direct environmental consequences of the physical plant are not significantly negative and are within the context of surrounding farming activities. Overall, the environmental impacts are to be considered positive resulting in a more vigorous sustainable agriculture. The treatment of pesticides at the plant is satisfactory. The training regime that Cargill gives its personnel and pesticides applicators is sufficient mitigation to avoid the possibility or minimize the frequency of spills. Compliance with Ukrainian laws regarding conservation methods in farming will prevent or significantly minimize spills, and the movement of pesticides to water ways. The indirect environmental impacts of the project are significantly positive for the environment. Improved seed stocks of high value will improve yields, reduce inputs and employ people. These factors are known to be beneficial to conservation and environmental values.

(9) LIST OF PREPARERS

Wayne Williams, Lena Lopantseva , and Jo Anne Williams completed the Environmental Assessment. Dr. Williams is currently the Environmental Officer for Citizens Network for Foreign Affairs projects in Kiev, Ukraine. He received his doctorate from the University of California, Davis in Plant Pathology. He has extensive experience in the Environmental Assessment field, successfully completing several dozen Environmental Assessments for USAID in Central America from 1991 through 1995 in his capacity as Regional Environmental Advisor for USAID/ROCAP in Guatemala. These and other Environmental Assessments completed by Dr. Williams covered the widest possible range of topics including Integrated Pest Management, pesticide analysis, agricultural production, medical clinics construction, solid and liquid waste disposal, public health and other projects including large and medium sized industrial operations, including electrical power generating plants.. He has conducted extensive agricultural research on plant nutrition with macro and micro nutrients and varietal trials. Lena Lopantseva, Environmental Assistant for Citizens Network for Foreign Affairs projects in Kiev, Ukraine. She holds a Masters Degree in Physics with a Minor in Science Education. Jo Anne Williams has a Bachelors degree in Environmental Studies and Planning from Sonoma State University, California. She has had extensive experience in editing scientific and technical manuscripts. Both are staff members of the CNFA Environmental office and have helped in field observations, writing and editing of this document.

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(11) APPENDICES

- A.** Initial Environmental Evaluation and Scope of Work for EA
- B.** Original Environmental Assessment
- C.** Environmental Assessment Supplement
- D.** Photo Album of Site
- E.** Maps of Region
- F.** List of Rare and Endangered Species in Donetsk Oblast and **Surroundings**
- G.** **Toxicity Specifications of Pesticides for Project**