



LAC-IEE-04-48

ENVIRONMENTAL THRESHOLD DECISION

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| <u>Project Location:</u> | Haiti |
| <u>Project Title:</u> | Health System 2004 (Phase 2: HS 2004) |
| <u>Project Number:</u> | 521-0267 |
| <u>Funding:</u> | Additional US \$4.55 million |
| <u>Life of Project:</u> | FY 2000 - FY 2005 (HS-2004) |
| <u>IEE Prepared by:</u> | Jean Wesnel C. Saint Cyr, MEO USAID/Haiti |
| <u>Recommended Threshold Decision:</u> | Categorical Exclusion/Negative Determination with Conditions |
| Bureau Threshold Decision: | Concur with Recommendation |

Comments:

Under the components of this program that are basically training, public information, social marketing, monitoring, education, and limit maintenance of facilities there will be no negative impact on the physical environment or pose any significant risk on the welfare of the surrounding community as well as non-target organisms. However some of the components, e.g. providing hypochlorite for water decontamination and activities which involve medical wastes can have potential negative impacts unless the guidelines and mitigating measures in the attached IEE are carefully followed.

Therefore, per 22CFR216.2(c)(1)(i)&(ii), a **Categorical Exclusion** is issued for activities such as basically training, public information, social marketing, monitoring, and education which will have no direct effect on the environment, and thus are eligible for a categorical exclusion.

A **Negative Determination** is issued for minor maintenance and equipment supply activities involving provision or repair of water filters for medical facilities.

A **Negative Determination with conditions** is issued for activities involving provision of home filters and hypochlorite, and activities which generate medical waste. The conditions are that all best management

practices, mitigating measures, and guidelines recommended in the attached IEE will be carefully followed by the implementing agent.

CTOs are responsible for making sure environmental requirements are met, especially the conditions set in the IEE. It is the responsibility of the SO Team to ensure that the SOAG and MAARDs for contracts and grants contain specific instructions to this effect.

The Mission Environmental Officer (MEO) will conduct spot checks to ensure that conditions in the IEE and this ETD are met and to ensure that all activities are implemented in an environmentally sound and sustainable manner in full accordance with all salient Agency and USG policies and regulations.

Date _____
George R. Thompson, P.E.
Bureau Environmental Officer
Bureau for Latin America and the Caribbean

- Copy to : David Adams, Director, USAID/Haiti
- Copy to : Jean Wesnel C. Saint Cyr, MEO, USAID/Haiti
- Copy to : Victor Bullen, acting REA
- Copy to : Beth Cypser, LAC/CAR
- Copy to : Gerald Barth, LAC/CAR
- Copy to : IEE File

Attachment: IEE

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**INITIAL ENVIRONMENTAL EXAMINATION
Addendum #2 to LAC-IEE-04-01**

Project Location: Haiti

Project Title: Health System 2004 (Phase 2: HS 2004)

Project Number: 521-0267

Funding: Additional US \$4.55 million

Life of Project: FY 2000 - FY 2005 (HS-2004)

IEE Prepared by: Jean Wesnel C. Saint Cyr, MEO
USAID/Haiti

Concurrence:

George Callen, Acting Chief
Economic Growth & Education Office
USAID/Haiti

Sally Patton, Chief
Policy Coordination and Program Support Office
USAID/Haiti

Clearance:

Pamela Callen, Acting Mission Director
USAID/Haiti

Jeffrey Miller, Regional Environmental Advisor
(Caribbean)

Recommended Threshold Decision: Categorical Exclusion/Negative Determination with Conditions

LAC BUREAU ENVIRONMENTAL OFFICER'S DECISION

Approved: _____ Date _____

Background

The health and nutritional status of Haitian children is generally very poor, as reflected in high levels of child mortality. Overall, the under-five mortality rate remains the highest in the Western Hemisphere at 890/1000. For comparison, the average under-five mortality rate in the LAC region is 47/1000. While there has been some improvement in the under-five mortality in Haiti during the past 20 years, the proportion of one-year old children dying before reaching their fifth birthday has actually increased since the late 1980s. About one of every 13 children dies before his first birthday, and of those who survive a year, about one of every 24 will not reach his fifth birthday.

This rise in infant mortality is inextricably linked to the recent deterioration in economic and environmental conditions and in the precarious nutritional situation of most households in Haiti. The 2000 survey done by the Demographic and Health Survey (EMMUS III) indicated that 26% of children younger than five experienced diarrheal episodes. According to the survey, only 10.7% of the Haitian population has access to a water faucet in their living space. According to the Pan-American Health Organization (PAHO), almost all of the 18 major water springs supplying Port-au-Prince are polluted. Furthermore, only 0.4% of the population has access to a private toilet, 23.5% share latrines, while almost 40% have no latrine or designated space for defecation, which contributes to the contamination of drinking water sources in Haiti and results in the increase of diarrhea occurrence in Haiti's young children.

This addendum to LAC-IEE-04-01 is being submitted in response to USAID/Haiti Health SO Team Leader's request to add a new water and sanitation component to the current USAID/Haiti health program with supplemental Child Survival and Health (CSH) funding. The Mission will implement activities through the centrally-funded ACCESS project or the existing bilateral Health Services 2004 (HS 2004) project with Management Sciences for Health (MSH). This supplemental Initial Environmental Examination (IEE) is set forth in accordance with the Agency's environmental regulations (22 CFR 216).

Program Description

The proposed activities will be implemented by Population Services International (PSI) through with the U.S. Centers for Disease Control and Prevention (CDC) and through the USAID/Washington ACCESS project in collaboration with the Mission's HS 2004 program for \$4.55 million. These activities will provide access to potable water by introducing low-cost, highly effective systems at the point-of-use, promoting improved basic hygiene practices and providing technical assistance to the Ministry of Health (MOH) and health centers managed by non-governmental organizations (NGOs) across the country. More specifically, these activities will help reduce diarrheal incidents in targeted areas by providing inexpensive water treatment solutions and storage containers and enhancing safe delivery/maternity systems in Haiti.

The project will be achieved through the following outputs:

1) Safe Water Initiative (\$2.75 million): Under this initiative plans to support:

- a. Household Safe Water Systems (SWS). The SWS was developed by CDC and PAHO in response to the cholera epidemic in South America. It is currently promoted and distributed by PSI, with technical support from CDC, in eight developing countries in Africa. The SWS relies on diluted sodium hypochlorite solution (chlorine bleach) to disinfect water at the point-of-use by inactivating microbial pathogens that cause diarrhea. The CDC model uses a covered water storage vessel such as a five-gallon plastic bucket. USAID/Haiti expects to purchase up to 40,000 units and distribute them to households throughout the country through the existing MSH NGO network in collaboration with PSI. The purpose of this component is to increase the consumption of safe drinking water by promoting disinfection and safe storage at the point-of-use, and ultimately promote healthier behaviors linked to diarrheal disease prevention.
- b. Health center water filter units. Under this sub-agreement, up to 15 filtering units will be built and installed in selected health centers throughout the country. These units are completely above-ground and act as a filter, rather than a water source, and can be installed in a truck bed.
- c. Water system repair at the Justinian Hospital in Cap Haitian: Piping systems and cisterns will be repaired at the hospital and filtering systems will be provided.

2) Purchase of Essential Medicines (\$500,000): The Mission's centrally-funded Rational Pharmaceutical Management (RPM) project will purchase the medicines (type to be determined with the MOH and MSH). The medicine will be stocked initially at the PAHO - PROMESS warehouse (the national warehouse in Haiti used for drug storage) and distributed through the MSH NGO network throughout the country.

3) Local Lodging and Transport Costs (up to \$300,000): USAID/Haiti will provide lodging and local transport for a group of Haitian Diaspora physicians volunteering their time at the Port-au-Prince University hospital under the auspices of the Association des Mediciens Haitiens à l'Etranger (AMHE).

4) Support to Community-Based Reproductive Health and Maternity Services in Haiti: The Mission will provide technical assistance, training, and supervision to clinical care providers in 15-25 MOH and NGO health centers throughout the country. This support is expected to be implemented through the USAID/Washington ACCESS project. In addition, this activity will include the purchase of 30,000-40,000 safe delivery kits for home or institutional births. The kits will be assembled in Haiti and the basic components include a plastic sheet, rubber gloves, thread to tie the umbilical cord, and a razor blade. USAID/Haiti will include training to the midwives and clients on the safe disposal of the sharps and other materials.

Description of Environmental Impact

Outputs 1b, 2, and 3 of this program are consist of training, social marketing, and logistical support and thus would have no negative impact on the physical environment or pose any significant risk on the welfare of the community.

However, the use of sodium hypochlorite for the disinfection of drinking water in Output 1a could potentially have negative effects on the welfare of the beneficiaries if mitigation measures and Best Management Practices (BMPs) are not implemented by the contractor(s). In addition under Output 4 (Support to Community-Based Reproductive Health and Maternity Services in Haiti), the potential negative impacts include infections and injuries from the handling of sharp objects and as a result of the disposal of blood products. However, MSH has extensive experience on the handling of sharps and medical waste disposal.

Overview of sodium hypochlorite

Sodium hypochlorite (NaOCl) is a pale yellow-green clear solution in appearance with a characteristic odor. It is a strong oxidizing and corrosive substance and has a caustic effect on eyes, skin and clothes. Additionally, sodium hypochlorite releases suffocating chlorine gas when it reacts with acids. The main field applications of chlorine include the textile industry, paper industry, and disinfection and cleaning processes.

Sodium hypochlorite is often purchased commercially at 10 to 15% strength. The oxidizing nature of this substance means it should be handled with extreme care. Contacts with acid will rapidly liberate chlorine gas, which will react with many chemicals, such as iron, copper and nickel. Sodium hypochlorite also dissolves in water to form hypochlorous acid. The formation of sodium hydroxide from this process results in an increase in the pH level.

Human effects and environmental fate of sodium hypochlorite

Sodium hypochlorite at concentrations of 5%, 10%, and 15% is an irritant and may cause skin, eye, and respiratory tract irritation. Dermatitis may result from direct skin contact. Ingestion of a few ounces or more of the chemical, especially bleach (5%) may result in medical complications. Sodium hypochlorite solution mixed with acids such as vinegar and ammonia produces chloramine gas which can result in burning of mucous membranes and chemical pneumonia.

The active ingredient of sodium hypochlorite is chlorine. Although it has successfully been used to treat water and kill many pests, chlorine is not especially effective against cysts (a leading source of dysentery) and provides no protection against microorganisms such as *Cryptosporidium*, *Giardia* and amoebic dysentery cysts. Chlorine reacts with many naturally occurring organic and inorganic compounds in water to produce undesirable effects. High concentrations of sodium hypochlorite solutions are unstable and produce chlorate as a byproduct, and it is less effective at high pH.

More importantly, it is well-established that chlorine contributes to many known and suspected cancer-inducing agents such as chloroform, carbon tetrachloride and many other halogenated hydrocarbons. Chlorine also has been implicated in heart disease.

Mitigation Measures

Below are some mitigative measures to be used under this sub-agreement along with the recommendations:

1) Design criteria for water storage vessels

A variety of water storage vessel designs may be used to protect water. USAID endorses the following CDC and PAHO guidelines for the design of safe water storage tanks/vessels:

- a) The vessel must be constructed of translucent high-density polyethylene plastic or similar material that is durable, lightweight, monoxidizing, easy to clean, inexpensive, and able to be produced locally;
- b) The vessel must hold an appropriate standard volume (e.g., 20 liters) and have a stable base and a sturdy, comfortable handle for easy carrying;
- c) The vessel must have a single opening five to eight centimeters in diameter with a strong, tightly fitting cover that makes it easy to fill the container and add disinfectant but difficult to immerse hands or utensils;
- d) The vessel must have a non-rusting, durable, cleanable spigot for extracting water;
- e) The vessel must allow air to enter as water is extracted; and
- f) The vessel must have volume indicators and illustrations of safe water handling practices displayed on the outside of the vessel.

2) Handling and use of sodium hypochlorite:

Several environmental factors influence the inactivation efficiency of chlorine, including water temperature, pH, contact time, mixing, turbidity, interfering substances and the concentration of available chlorine. In general, pH and temperature have the largest impact on pathogen inactivation by chlorine.

- a) For typical drinking water treatment temperatures, pathogen inactivation increases with temperature.
- b) Sodium hypochlorite solution is a corrosive liquid with an approximate pH of 12 (AWWA, 1990). Therefore, typical precautions for handling corrosive materials such as avoiding contact with metals, including stainless steel, should be used.
- c) Sodium hypochlorite solutions may contain chlorate. Chlorate is formed during both the manufacturing and storage of sodium hypochlorite (due to degradation of the product). Chlorate formation can be minimized by reducing the degradation of sodium hypochlorite, limiting storage time, avoiding high temperatures and reducing light exposure.

- d) Spill containment must be provided for the sodium hypochlorite storage tank (plus freeboard for rainfall or fire sprinklers) with no uncontrolled floor drains.
- e) The storage temperature for sodium hypochlorite shall be below 125oF.
- f) Avoid ultraviolet exposure which tends to decompose hypochlorite. Tanks should be indoor or pigmented to reduce ultraviolet exposure potential.
- g) If decomposition of the hypochlorite stored is suspected, empty the tank as quickly as practical through normal use. If normal consumption will not empty the tank within 30 to 60 days, arrangements should be made to empty the tank and rinse it thoroughly.
- h) All personnel should be made aware of the hazards and the safety precautions that must be observed when handling this chemical

3) First aid measures

- a) Inhalation: Remove patient to fresh air. Check the breathing and pulse. If not breathing, give artificial respiration. If breathing is difficult give oxygen. Immediately seek medical advice. It irritates nose and throat causing coughing, breathing difficulty and pulmonary edema.
- b) Skin contact: As quickly as possible, flush contaminated area with lukewarm water, gently running water, remove contaminated clothing, shoes and leather goods. Seek medical advice. It causes severe skin irritation with blistering and ulceration.
- c) Eye contact: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 29 minutes, holding the eyelids open. Take care not to rinse contaminated water into non-affected eye. Seek medical advice.
- d) Ingestion: Do not induce vomiting. If conscious, do not give anything by mouth. Check breathing and pulse. If breathing has stopped, trained personnel should give artificial respiration. If hearth has stopped, give cardiopulmonary resuscitation (CPR). If conscious, give one cup (250-300 ml) of water to drink immediately. Give repeated drinks of water at a rate of one cup every ten minutes. If vomiting occurs naturally, rinse mouth and repeat administration of water. Obtain medical attention immediately. Acute toxicity LD₅₀: 12mg/kg. Ingestion of this chemical may cause abdominal cramps, nausea, vomiting, diarrhea, shock and even lead to convulsions, coma and death.

4) Fire fighting measures

Sodium hypochlorite is nonflammable but is decomposed by heat, light and acidic conditions. Pressure buildup in containers could result in an explosion when heated or on contact with acidic fumes. Vigorous reaction with oxidizable organic materials may result in a fire. Approved canister type for respirators suitable for chlorine, tight fitting chemical goggles, rubber PVC gloves, boots and apron should be made available to personnel as protective equipment.

Mitigative Measures for the Safe Management of Medical and Biological Wastes:

All Mitigations Measures and BMPs set forth in LAC-IEE-00-05 and LAC-IEE-04-01 for medical and sanitary wastes handling and disposal shall be implemented under this project.

It is USAID/Haiti's understanding that MSH and its partners and sub-grantees will continue and reiterate worker training, including: a basic understanding of steam-based treatment systems; standard operating procedures; and occupational safety (e.g., proper waste handling techniques, needle-stick injuries, blood splatter or aerosolized pathogens if red bags are broken or compacted, record- keeping, proper identification of waste bags, etc.)

The Mission Environmental Officer (MEO) will conduct spot checks to ensure that proper waste plans are in place under this sub-agreement.

The mitigation recommendations indicated above should prove sufficient to alleviate any significant environmental concerns associated with the proposed sub-agreement activity. It is therefore concluded that, if implemented as recommended above, this sub-agreement activity can be completed in an environmentally-sound and sustainable manner in full accordance with all relevant Agency and USG policies and regulations.

Recommendations

1- Categorical Exclusion

Funded activities such as training, public information, social marketing, monitoring, education will have no direct effect on the environment, thus fall under the class of actions eligible for a categorical exclusion.

2- Negative Determination with conditions

A Negative Determination with conditions should be issued for activities involving the handling and use of sodium hypochlorite for the disinfection of potable water within project's targeted areas. The above Mitigation Measures, and guidelines recommended by CDC and PAHO on SWS shall be followed. MSH and its network of partners and sub-grantees will continue to implement all mitigation measures and BMPs recommended by USAID under previous agreements for the safe handling of medical waste within clinics supported by the HS-2004 program.

The Mission Environmental Officer (MEO) will conduct spot checks to ensure that proper handling and use of the proposed chemical are taking place in project target areas under this sub-agreement.

ACCESS will conduct an evaluation of effectiveness and appropriateness of the environmental mitigation measures from the initial phase of this health activity, and make appropriate recommendations for any needed changes. The evaluation should be conducted submitted to the MEO and BEO for approval by 30 November 2004.