全球环境基金-中国聚氯乙烯生产汞削减及最小化示范项目

汞废物和污染场地子活动实施环境和社会影响评估

工作大纲

# 背景

《关于汞的水俣公约》（以下简称“公约”）自2017年8月16日起生效。电石法聚氯乙烯（PVC）生产行业是公约管控的用汞工艺之一。公约要求：（1）到2020年，电石法聚氯乙烯单位产品的汞使用量比2010年下降50%；（2）采取措施减少对原生汞矿的依赖；（3）控制汞向环境的排放；（4）支持无汞催化剂和工艺的研发；（5）在缔约方大会已证实基于现有工艺的无汞催化剂技术和经济可行，且在全球范围内均可采购的5年之后，不允许使用汞。

为了控制电石法PVC生产的汞使用和排放、推动无汞技术的工业化应用，我中心与联合国工业发展组织（UNIDO）联合申请了“全球环境基金-中国聚氯乙烯生产汞削减及最小化示范项目”（以下简称PVC项目或项目）。该项目以汞的全生命周期管理为核心，通过重点省和重点企业的示范和推广，减少汞的使用和排放，并进一步推动无汞替代技术工业化示范，推动行业履行公约。该项目主要活动包括：

（一）政策法规、机构能力、意识提升的加强；包括制定PVC行业汞污染防治相关要求以及其他的法规和排放标准，加强相关管理部门的能力建设，提高执法能力和监管力度；加大相关汞污染和危害的宣传教育，提升公众和职业人群对汞污染的意识；

（二）示范和推广PVC生产过程低汞触媒的高效应用和汞污染防治的技术改造及提升，以及生产过程中产生的相关废汞触媒、含汞废酸、废水等环境无害化管理的最佳环境实践和最佳环境经验；

（三）低汞触媒的全过程控制与管理示范，减少汞的排放和污染。包括提高汞触媒的催化性能，从源头上减少汞的使用；开展生产过程中汞流向研究（PRTR），通过清洁生产等手段实现过程控制，优化相关工艺，减少汞的使用和排放；严格监控废汞触媒、含汞废活性碳、废酸和废水等，编制涉PVC行业含汞废物清单，加大含汞废物回收利用和无害化处理实现末端治理，减少汞的排放和污染；

（四）无汞催化剂以及无汞替代技术、替代工艺的示范，包括制定无汞替代技术和工艺的评估标准，对潜在替代技术等进行示范；

（五）含汞废物环境无害化技术的研究及现状评估，涉PVC生产汞污染场地初步评估调研及相应的减少汞污染的风险管控措施编制。

项目自2017年实施至今，已完成了部分活动的实施，部分活动在积极推进中，部分活动待启动（具体见附件1）。按照UNIDO环境与社会安全保障政策与措施（ESSPP）及全球环境基金（GEF）关于环境和社会管理政策要求，需对项目申请期间编制的“中国聚氯乙烯生产汞削减及最小化示范项目环境和社会管理计划（以下简称PVC项目ESMP）”（见附件2）开展定期评估，并对涉及技术改造、技术示范和场地修复等工程类活动产生的环境和社会影响开展评估,编制相应的环境和社会管理文件，为减缓项目实施过程中可能产生的环境和社会影响提供指导。为此，特制订本咨询服务工作大纲。

# 目标

按照UNIDO的《环境与社会安全保障政策与措施》（ESSPP）要求）及全球环境基金（GEF）关于环境和社会管理政策要求，开展PVC项目ESMP实施进展评估，开展涉及技术改造、技术示范和场地修复等工程类活动产生的环境和社会影响评估，为项目实施期间相关活动产生的环境和社会影响提出减缓建议等技术支持。

# 工作内容

为实现上述工作目标，咨询单位需要开展以下内容的工作：

**（一）开展PVC项目ESMP实施进展评估**

基于PVC项目ESMP，全面梳理PVC项目活动实施进展情况，重点对2021年7月PVC项目中期评估之后完成以及新启动的活动产生的环境和社会影响进行评估，定期编写评估进展报告。

**（二）开展废汞触媒回收技术改造活动的环境和社会影响评估**

针对参与废汞触媒回收技术改造活动的2-3家废汞触媒回收利用企业，开展技术改造活动的环境和社会影响评估，编制企业层面的技术改造活动环境影响评估报告（EIA）、环境社会管理计划（ESMP）以及性别评估报告（GAP）。

**（三）开展PVC行业汞污染场地修复方案实施的环境和社会影响评估**

项目将组织编制2块PVC行业汞污染场地的修复方案，对这2个修复方案开展修复方案实施的环境和社会影响评估，编制每个修复方案的环境影响评估报告（EIA）、环境社会管理计划（ESMP）以及性别评估报告（GAP）。

# 工作产出

本咨询任务的产出（均须提交中英文版本）主要包括以下：

1. PVC项目环境和社会管理计划（ESMP）实施进展报告（2023年6月、2024年6月、2025年6月和2026年3月分别提交一次）；
2. 废汞触媒回收技术改造活动环境影响评估报告（EIA）（2023年6月前提交）；
3. 废汞触媒回收技术改造活动环境社会管理计划（ESMP）（2023年12月前提交）；
4. 废汞触媒回收技术改造活动性别评估报告（GAP）（2023年12月前提交）；
5. PVC行业汞污染场地修复方案实施的环境影响评估报告（EIA）（2023年12月前提交）；
6. PVC行业汞污染场地修复方案实施的环境社会管理计划（ESMP）（2024年6月前提交）；
7. PVC行业汞污染场地修复方案实施的性别评估报告（GAP）（2024年6月前提交）。

# 工作时间安排

本咨询服务期从合同签订之日起到2026年4月。

表1 咨询服务工作时间表

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **时间（年）****工作内容** | **2023年**  | **2024年** | **2025年** | **2026年** |
| 调研分析示范企业基本信息及示范活动内容，了解项目总体活动设计 | **X** |  |  |  |
| 编写PVC项目环境和社会管理计划（ESMP）实施进展报告 | **X** | **X** | **X** | **X** |
| 开展废汞触媒回收技术改造活动环境影响评估报告（EIA）、环境社会管理计划（ESMP）、性别评估（GAP） | **X** | **X** | **X** |  |
| 开展PVC行业汞污染场地修复方案实施的环境影响评估（EIA）、环境社会管理计划（ESMP）、性别评估（GAP） | **X** | **X** | **X** |  |
| 参与项目相关会议并讨论修改完善上述产出报告 | **X** | **X** | **X** | **X** |

# 支付进度

表2产出支付进度表

|  |  |  |  |
| --- | --- | --- | --- |
| 序号 | 产出 | 支付时间 | 支付比例 |
| 1． | 合同签署后预付款 | 合同签署后30天内 | 30% |
| 2. | PVC项目环境和社会管理计划（ESMP）实施进展报告（中英文，2023年6月前提交） | 通过验收后30天内 | 30% |
| 废汞触媒回收技术改造活动环境影响评估报告（EIA）（中英文，2023年6月前提交） |
| 废汞触媒回收技术改造活动环境社会管理计划（ESMP）（中英文，2023年12月前提交） |
| 废汞触媒回收技术改造活动性别评估报告（GAP）（中英文，2023年12月前提交） |
| PVC行业汞污染场地修复方案实施的环境影响评估报告（EIA）（中英文，2023年12月前提交） |
| 3. | PVC项目环境和社会管理计划（ESMP）实施进展报告（中英文，2024年6月前提交） | 通过验收后30天内 | 20% |
| PVC行业汞污染场地修复方案实施的环境社会管理计划（ESMP）（中英文，2024年6月前提交） |
| PVC行业汞污染场地修复方案实施的性别评估报告（GAP）（中英文，2024年6月前提交） |
| 4. | PVC项目环境和社会管理计划（ESMP）实施进展报告（中英文，2025年6月前提交） | 通过验收后30天内 | 10% |
| 5. | PVC项目环境和社会管理计划（ESMP）实施进展报告（中英文，2026年3月前提交） | 通过验收后30天内 | 10% |

# 资质要求

**（一）单位资质**

1. 熟悉全球环境基金（GEF）的《环境和社会安保政策》、UNIDO《环境与社会安全保障政策与措施》（ESSPP）或世界银行等其他国际组织的环境绩效标准；
2. 具有国际合作项目环境影响评估（EIA）和社会影响评估（SIA）的项目经验（需列明承担相关工作或项目名称、简介）；
3. 具有涉重金属的化工环保领域环境影响评估（EIA）项目经验（需列明承担相关工作或项目名称、简介）。

**（二）人员资质**

 1.项目负责人需具备以下资质（需提供简历）

1. 注册环评师或高级职称及以上；
2. 具有至少5年环境影响评估和社会管理相关报告编写工作经历（需提供证明材料）；
3. 具有较好的组织沟通和协调能力。

2.项目团队（至少2-3名核心成员）需具备以下资质（需提供简历）

* 1. 团队中至少有1名环境专家，在环境健康和安全（EHS）审计或环境影响评估方面具有5年及以上经验，具备化工环保领域的项目经历（需提供证明材料）；
	2. 团队中至少有1名社会领域专家，在社会影响评估、利益相关方参与、社区健康与安全管理方面具有5年及以上跟踪经验（需提供证明材料）；
	3. 团队中至少有1名性别专家，在性别研究领域的方面具有5年及以上跟踪经验（需提供证明材料）；
	4. 具备组织开展信息收集和现场调查的沟通和协调能力；
	5. 具有较好的英文交流和写作能力。

附件：1. 中国聚氯乙烯生产汞削减及最小化示范项目活动进展一览表

 2. 中国聚氯乙烯生产汞削减及最小化示范项目环境和社会管理计划（ESMP）

附件1

中国聚氯乙烯生产汞削减及最小化示范项目（PVC项目）

活动进展一览表

|  |  |
| --- | --- |
| **活动类别** | **活动名称****（工程类、场地监测等）** |
| 已完成活动 | 低汞触媒高效应用和汞污染防治试点 |
| 低汞触媒高效应用和汞污染防治推广活动 |
| 在执行活动 | 行业汞的清洁生产审核指南研究 |
| 行业含汞废物环境无害化管理研究 |
| 待启动活动 | 废汞触媒回收处置企业技术改造活动 |
| 涉电石法PVC行业汞污染场地初步风险评估活动 |
| 涉电石法PVC行业汞污染场地风险评估和开展场地修复技术指南研究 |

附件2

中国聚氯乙烯生产汞削减及最小化示范项目（PVC项目）

环境和社会管理计划（ESMP）

**Environmental and Social Management Plan for the VCM Project**

**1 Project Description**

**1.1 Locations and environment of project**

In order to reduce risks of mercury on human health and the environmental impact from industrial production of Vinyl Chloride Monomers, Foreign Economic Cooperation Office (FECO), Ministry of Environmental Protection, China has developed a project titled **Demonstration of Mercury Reduction and Minimization in the Production of Vinyl Chloride Monomer in China (short for VCM Project)** in cooperation with the United Nations Industrial Development Organization (UNIDO), which will be funded by Global Environment Facility (GEF).

The project is to strengthen institutional, regulatory, and enforcement (IRE) capacity in VCM production in China, promote technology transfer and investment for the widespread application of BAT/BEP and the recovery of mercury in mercury-containing waste from VCM production, conduct contaminated site identification and risk reduction associated with VCM production, information dissemination and awareness raising among stakeholders, monitor and evaluate the results of project.

Main activities in the VCM Project include building institutional, regulatory, and enforcement capacity to fulfill obligations concerning VCM production sector under the Minamata Convention, reducing mercury emission and dioxin release reduced from VCM production through promotion of BAT/BEPs, promoting the recovery of mercury from mercury-containing waste in VCM production process, developing appropriate strategies for identifying and assessing mercury contaminated sites from VCM production, promotion the sharing of knowledge, experience and lesson and raising environmental awareness among stakeholder groups, and monitoring & Evaluation.

The VCM Project is to achieve 50% reduction of mercury use in per unit production by the year 2020 (reference year 2010) and achieve 90% recovery of mercury in production processes, which mainly through BAT/BEP promotion in the PVC production with low-mercury catalyst, mercury-free technology demonstration in VCM production, and environmentally sound management of mercury –containing waste and contaminated sites.

At present the locations of project activities for the application of BAT/BEPs cannot be given and the specific environmental and social information about project locations will not be included in this environmental and social management plan. However, the selected plants for conduction of the project activities will be determined during project implementation phase according to selection mechanism set during PPG stage, which require that the output of PVC production of the selected plants must be higher than 0.2 million tons per year. In China these PVC production plants should in built in chemical industrial park. According to the guidance on the development of chemical industry park issued by Ministry of Industry and Information Technology of the People’s Republic of China, the plants in chemical industrial park must be located far away from environmental sensitive areas such as ecological red line areas, natural protection area, drinking water source protection areas, basic farmland protection areas and so on. They should also be far away from towns, villages and all settlements. There should be isolation belt and adequate safety and health protection distance between the plants and residential area. Chemical industrial park should firstly build unified municipal facilities including spacious road, separate drainage system, centralized sewage treatment facilities and solid waste disposal facilities. It should also have unified plan, construction and management for public projects including water supply (industrial and domestic water), power supply, heat supply (high, medium, low pressure steam), industrial gases, and public pipe gallery.

For the application of low mercury BAT/BEPs technology and the demonstration of mercury-free alternative, the project is focusing on process conversion, updating of existing facilities and replacing of current equipment in established facilities by using different technologies. It is an updating project and will use the former reactors as far as possible. Generally no new reactors will be built. If necessary, the new reactors will be built on the same place with the old reactors or close to the old equipment.

**1.2 Environmental and social risk screening**

As the project activities are all located in VCM production plants in Chemical industrial park, the project will obviously not involve the issues about protection of natural habits, involuntary resettlement, indigenous people, physical cultural resource, safety of dams, and pest management.

The VCM Project is an updating project and will use the former reactors as far as possible. As the engineering quantity is relatively small in replacing/updating phase, it is not necessary to employ many workers to accomplish these activities. Most workers will be employed from local communities. The workers who are originally responsible for PVC production with high mercury catalyst can also grasp the skills for PVC production with low mercury catalyst or mercury-free alternatives after adequate training. So the operation of low-mercury and mercury-free technology will employ few workers. Mercury-free technology demonstration will be conducted for 10,000 tons of PVC production. This will need a small amount of mercury-free catalyst and the present market and production line can afford to it. There is no need to hire workers associated with mercury-free catalyst preparation to carry out the VCM Project. These indicate that there is no much concern with un-employment of the workers in local community and the hiring of locals resulted from the activities in the subproject area.

Through environmental and social risk screening according to a step-by-step guidance in the UNIDO ESSPP, the project activities may cause some environmental pollution and health and safety issues during replacing/updating phase and implementation phase of demonstrations. It falls under Category B for UNIDO projects through environmental and social risk screening according to a step-by-step guidance in the UNIDO ESSPP. It is likely to have less adverse impacts, which will be few in number, site-specific, and few if any will be irreversible. In most cases impacts can be readily minimized by applying appropriate management and mitigation measures or incorporating internationally recognized design criteria and standards.

Since the location of project activities cannot determined at present, some environmental and social risks may not be identified. However, they will be supplemented after the determination of locations for mercury-free demonstration and BAT/BEPs promotion during project implementation phase and the relevant environmental and social impact will be assessed.

**2 Policy, legal, and administrative framework**

**2.1 Policy Framework**

The general objective of the VCM Project is highly accord with Chinese policy of environmental protection. Chinese government vigorously prevent and control mercury pollution, and have signed Minamata Convention on Mercury on October 10th 2013.

In 2011, the State Council issued “Notice of the State Council on printing and distributing the plan for “Industrial transformation and upgrading (2011-2015)”, and it regulated to gradually eliminate high mercury catalyst use in calcium carbide process of PVC production.

In 2010, the Ministry of Industry and Information issued “Cleaner production technologies in the calcium carbide process of PVC production”, and low mercury catalyst, hydrochloric acid desorption technique, sodium hydrogen sulfide treatment technology for mercuric chloride are listed as cleaner production technologies that needs promoting. In 2011,the National Development and Reform Commission issued “Industry structure adjustment Guidance Catalogue (2011 Edition)”, and in it, the high mercury catalyst and high mercury catalyst use devices for PVC production are listed as the technologies which should be phased out firstly.

In 2012, the Ministry of Environmental Protection (MEP) released the “Directory of environmental protection technology that the nation encourage the development in 2012”, and low mercury catalyst technology was a preferred environmentally technology. In 2013, MEP issued the “12th Five-year plan for prevention and control of chemical environmental risks”, which emphasized the promotion of low mercury catalyst technology in the PVC industry, and listed efficient mercury recycling technology as a major focus area.

In PVC industry, mercury pollution control has been included in the "13th five-year plan for prevention and control of heavy metals and toxic and harmful chemical substances pollution” draft. PVC industry will become key area in the next stage of heavy metal management.

**2.2 Legal and Administrative Framework**

The administrative framework for environment in the PRC consists of national, provincial and local (city) environmental protection authorities. The national authority is the Ministry of Environmental Protection (MEP), who promulgates laws, regulations and technical guidelines on environmental pollution prevention and control. At the provincial level, Environmental Protection Departments (EPDs) are mandated with control and regulation of environmental pollution prevention and control in the province. The local or city-level Environmental Protection Bureaus (EPBs) enforce environmental laws and conduct environmental monitoring within city limits.

**2.3 Laws, Regulations, Guidelines and Standards**

**PRC requirements.** The VCM Project must satisfy a range of national laws, regulations, guidelines and standards. Table2.1 lists PRC environmental laws, regulations, guidelines and standards relevant to this project. These comprehensive requirements cover pollution prevention and control on air, noise, water, ecology and solid waste and are supported by a series of technical guidelines and standards.

**Table 2.1 Relevant PRC Laws, Regulations, Guidelines and Standards**

|  |
| --- |
| **Laws and regulations**  |
| 1 | Environmental Protection Law, December 26, 1989 |
| 2 | Atmospheric Pollution Prevention and Control Law, September 1, 2000 |
| 3 | Noise Pollution Prevention and Control Law, March 1, 1997 |
| 4 | Water Pollution Prevention and Control Law, June 1, 2008 |
| 5 | Solid Waste Environmental Pollution Prevention and Control Law, April 1, 2005 |
| 6 | Water Law, October 1, 2002 |
| 7 | Water and Soil Conservation Law, June 29, 1991, amended December 25, 2010 |
| 8 | Promotion of Cleaner production Law, January 1 2003 |
| 9 | Environmental Impact Assessment Law, September 1, 2003 |
| 10 | Energy Conservation Law, January 1, 1998 |
| 11 | Wild Animal Protection Law, August, 2004 |
| 12 | Water and Soil Conservation Law, March 1, 2011 |
| 13 | Cultural Relics Protection Law, October 2002 |
| 14 | Cultural Relics Protection Implementation Regulation, July 1, 2003 |
| 15 | Construction Project Environmental Protection and Management Regulation, (State Department Order No. 253), November 29, 1998 |
| 16 | Plan Environmental Impact Assessment Regulation, (State Department Order 559), October 1, 2009 |
| **Guidelines** |
| 1 | Technical Guidelines for Plan Environmental Impact Assessment (on trial) (HJ/T 130-2003) |
| 2 | Technical Guidelines for Environmental Impact Assessment: General Program (HJ 2.1-2011) |
| 3 | Guidelines for Environmental Impact Assessment: Atmospheric Environment (HJ 2.2-2008) |
| 4 | Technical Guidelines for Noise Impact Assessment (HJ 2.4-2009) |
| 5 | Technical Guidelines for Environmental Impact Assessment: Surface Water Environment (HJ/T 2.3-93) |
| 6 | Environmental Impact Assessment Public Participation Interim Guideline, (MEP Announcement No. [2006]28) |
| 7 | Technical Guidelines for Environmental Impact Assessment: Public Participation (public comment version), (January 2011) |
| 8 | Technical Guideline on Environmental Monitoring Quality Management (HJ 630-2011) |
| 9 | Environmental Supervision Method (MEP Order No. [2012] 21) |
| **Standards** |
| 1 | Ambient Air Quality Standard (GB 3095-1996) and Amendment (MEP Announcement No. [2000]1) |
| 2 | Ambient Air Quality Standards (GB 3095-2012) [to replace GB 3095-1996 on January 1, 2016] |
| 3 | Air Pollutant Integrated Emission Standard (GB 16297-1996) |
| 4 | Environmental Quality Standard for Noise (GB 3096-2008) |
| 5 | Emission Standard for Community Noise (GB 22337-2008) |
| 6 | Emission Standard of Environmental Noise for Boundary of Construction Site (GB 12523-2011) |
| 7 | Technical Specifications to Determine the Suitable Areas for Environmental Noise of Urban Area, (GB/T 15190-94) |
| 8 | Environmental Quality Standards for Surface Water (GB 3838-2002) |
| 9 | Integrated Wastewater Discharge Standard (GB 8978-1996) |

**UNIDO ESSPP requirements.** This Project is classified as Category B for environment according to the UNIDO ESSPP. For project concepts that have been categorized as Category B, an ESIA will not be required, but an Environmental and Social Management Plan (ESMP) needs to be developed so as to integrate environmental and social sustainability elements into project design. Unlike ESIAs, ESMPs do not focus on impact prediction or evaluation. Relevant environmental and social issues will have been identified during the screening process, and these provide the focus for the mitigation, monitoring, and environmental and social management components of the ESMP.

**3 Environmental and social risks and mitigation measures**

**3.1Positive Environmental and social impacts**

The VCM Project will obtain significant environmental benefit. After implementation of the VCM project, it is to achieve about 50% reduction of mercury use in per unit production by the year 2020 (reference year 2010). Mercury consumption will be reduced by 360.5 t compared to 2014.

The VCM Project will also obtain significant economic benefit. In the VCM Project, 15 enterprises will adopt low-mercury catalyst to replace high-mercury catalyst and the replacement will save about US$6.5 million per year on the purchase of catalyst. The enterprises will also upgrade their environmental pollution treatment process including the application of highly efficient mercury-removal device, hydrochloric acid deep desorption technology, catalyst pumping system, rain and sewage diversion system, and sulfide precipitation process. After upgrading, the generation of waste catalyst and waste activated carbon would be reduced by 347 t, which will save 52.58 M$ for mercury recovery from waste catalyst and activated carbon by distillation. The release of mercury into hydrochloric acid and alkali liquid using low-mercury technology will be 335 t less than that of high-mercury technology. This also results in money saving of 30 M$ per year. Through the conduction of the VCM Project, the Hg discharge to the off-gas, liquid and solid waste generated in per ton of VCM production will be controlled to less than 10% of the current level. The reduction of mercury release into environment will obviously decrease the economic loss due to the hazard posed by mercury on environment and human health, which is inestimable.

The VCM Project can also promote the sustainable development of PVC industry and hardly pose adverse effect on society. it will provide PVC production enterprises with strong technical support and application experience, which will help them to reduce mercury production, use and emissions to the environment and conduct the activities to prevent mercury pollution. It also helps Chinese PVC production enterprise to study and reference foreign successful experience about cleaner production, and to improve its efficiency and competitive power. All of these finally promote the sustainable development of the PVC production industry.

**3.2 Adverse Environmental and social impacts**

**3.2.1 Replacing/updating phase**

The project is focusing on process conversion, updating of existing facilities and replacing of current equipment in established facilities. The groundwork for installation of new equipment and building of new reactor has already been constructed before. No digging will be done for the VCM Project. The replacing and updating activities will not cause traffic problem as project activities are of relatively small-scale and will be conducted in the chemical industrial parks which are far away from densely populated area and have spacious road in them.

The replacing and updating activities will produce a little amount of wastewater, which may hardly cause environmental pollution as the groundwork for these activities is cement ground and wastewater will be collected and discharged into drainage system. Finally the wastewater will flow into centralized sewage treatment facilities in chemical industrial park. As the quantity of wastewater is small, it will pose negligible impact on the operation of the centralized sewage treatment facilities.

The replacing and updating activities will necessitate temporary on-site storage of materials and wastes. The replacing and updating activities will be conducted in some high-grade PVC production plants. In these plants, there is a set of strict management procedures to manage the materials and wastes and specific person will be assigned to be responsible for these issues, which can hardly result in dispersion of materials in adjacent properties and cause waste solid pollution.

The replacing and updating activities may cause short-term air pollution, noise disturbance which may pose adverse impact on workers and pedestrians and will be elaborated below. **S**ome replacing and updating activities such as the use of cranes, elevated working environments and machines might create safety risks for both workers and pedestrians for improper operation or accidents.

**3.2.2 Project implementation phase**

Compared to conventional high-mercury process for VCM synthesis, low-mercury and mercury-free technology and BAT/BEPs promotion conducted in the VCM Project will reduce the emission of waste gas, the discharge of waste water and the production of waste solid. So the general public will not opposes the execution of the proposed project.

According to the design plan of the VCM Project, the effluent from the plants for mercury-free technology demonstration will be collected by separate drainage system and discharged into centralized sewage treatment facilities in chemical industrial park. The effluent from the centralized sewage treatment facilities must meet national and local regulations and standards. In the process of mercury recovery from waste catalyst, waste gas containing mercury generated in electric distillation furnace is introduced into condenser, gas-liquid separator, and adsorption tower in sequence and finally emitted into the atmosphere. The plants will design and use partial or full enclosures, windbreaks, hoods and other ventilation systems, and complete building evacuation to prevent and treat air pollution resulted from the fugitive emission of waste gas during pilot demonstration phase. The concentration of pollutants in the effluent gas can be controlled below the emission limits of national and local regulations and standards. These will cause negligible impact on environment.

During the implementation of the project, it is to enhance the cleaner production, strengthen pollution control and waste management, and demonstrate pollution control technology in the selected companies. 90% of mercury will be recovered from mercury waste to reduce risk from mercury pollution. The project team will develop a technical guidance for treatment and disposal of mercury wastes that are suitable for mercury recovery. For those mercury wastes not suitable for mercury recovery, the project will utilize other appropriate treatment and disposal solutions including landfill, solidification and stabilization, and other feasible technology. Due to strict and perfect management of waste solid generated in the VCM Project, there is hardly any pollution resulted from waste solid in VCM Project.

Noise resulted from the use of fan, air compressor and pump could potentially impact on workers. As located in workshop of the chemical plants far away from residential area, they have negligible effect on local residents living.

The VCM Project might face the risk that the increasing temperature will enhance the volatility of mercury which will result in higher emission of mercury into atmosphere during the storage and transport of mercury-containing waste.

The VCM Project might also face the risk of inappropriate maintenance and operation of established equipment/ facilities and technology failure, which will result in excessive discharge of pollutants and environmental pollution.

**3.3 Mitigation Measures**

This section describes relevant environmental and social risks identified at present and the proposed mitigation measures and agents responsible for their implementation (Table 3.1). Since ESMP should serve as an active tool, additional risks that are identified during the project implementation will be included as they are identified.

Table 3.1 Environmental and Social Impacts and Mitigation Measures

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **E&S risks** | **Mitigating****Measure** | **Technical details of the mitigation technology, process, equipment, design and operating procedures** | **Location** | **Timeline, including frequency, start and end date** | **Responsibility** | **Cost of Mitigation****(If Substantial; to be covered by the GEF grant or non-UNIDO co-financing)** |
| **Risks identified during the PIF preparation and verified during the project preparation(PPG)** | Smoke emissions from the use of machines and dust production during replacing and updating phase could result in annoyance to workers and pedestrians. | Dust suppression methods should be employed as needed to avoid visible dust: Effective smoke reduction methods should be employed as need to minimize the emission of smoke:Wearing personal protective equipment | Stockpiled soil and sand shall be slightly wetted before loading, particularly in windy conditions.Vehicles transporting soil, sand and other construction materials shall be covered. Limitations to speeds of transporting vehicles are necessary.All heavy equipment and machinery shall be fitted in full compliance with the national and local regulations.Fuel-efficient and well-maintained haulage trucks shall be employed to minimize exhaust emissions. Dust masks and eye protection against dust, splinters, debris etc. | At the sub-project area  | Throughout replacing and updating phaseThroughout replacing and updating phaseThroughout replacing and updating phase | Implementation : ContractorImplementation : ContractorImplementation : Contractor | 15000 $ co-financing Included in the project cost estimate15000 $ co-financing Included in the project cost estimate5000 $ co-financingIncluded in the project cost estimate |
| Noise generation from the use of machines and equipment during replacing and updating phase could pose impact on workers and pedestrians.  | Wearing personal protective equipmentConsider noise suppression capability in the procurement of vehicle and equipmentUse and maintain vehicles and machinery according to national and local regulation requirementsTake measures to minimize noise nuisance in the vicinity of working sites by way of adopting available acoustic methods. | Hearing protection for working around machinery where the noise exceeds 60 dB All heavy equipment and machinery shall be fitted in full compliance with the national and local regulationsLimiting working hours and all heavy equipment and machinery operated only in daylight hours.Maintain vehicles and machinery according to maintenance requirements.Well-maintained haulage trucks will be used with speed controls.Working equipment, which generates excessive noise, shall be enclosed or fitted with effective silencing apparatus to minimize noise. | At the sub-project area | Throughout replacing and updating phaseDuring project design and equipment procurement phasesThroughout replacing and updating phaseThroughout replacing and updating phase | Implementation : ContractorImplementation : Contractor and NMWTImplementation : ContractorImplementation : Contractor | 5000 $ co-financingIncluded in the project cost estimate15000 $ co-financingIncluded in the project cost estimate5000 $ co-financingIncluded in the project cost estimate10000 $ co-financingIncluded in the project cost estimate |
| Some replacing and updating activities such as the use of cranes, elevated working environments and machines might create health and safety risks for both workers and pedestrians for improper operation or accidents. | Adequate measures and appropriate system should be employed to ensure safety conditionsAdequate training should be conducted and health and safety plan should be included | Safe access and thoroughfare must be provided on site at all times. Dangerous areas shall be clearly identified with appropriate signsEnsure that proper safety gear, harnesses, etc., are utilized and use certified weldersConduct proper worker health and safety training and orientation prior to initiation of tasksInclude in contractors health and safety plan | At the sub-project area | Throughout replacing and updating phase Before replacing and updating phase | Implementation: ContractorInformation and consultation: Local Safety Supervision BureauImplementation : Contractor  | 16000 $ co-financingIncluded in the project cost estimate5000 $ co-financingIncluded in the project cost estimate |
| Noise resulted from the use of fan, air compressor and pump during pilot demonstration phase could potentially impact on workers. | Optimal design should be employed to reduce noiseStrength daily management to reduce noise  | Ensure that equipment to be used meets industry best standard in relation to noise attenuation.Install noise reduction facility to ensure the make noise level meet the relative standard.Undertake periodic inspection and ensure that noise suppression systems on plant and equipment generated noise are maintained. | At the sub-project area | At the stage of project design and equipment procurement.Throughout project implementation phase, once a week | Implementation: Contractor | 20000 $ co-financingIncluded in the project cost estimate8000 $ co-financingIncluded in the project cost estimate |
| Climate change might affect the mobility of mercury to the atmosphere and sea. | Selected technologies will be used to reduce mercury emissions and release to the river and the soil | Enhance mercury recovery rate on mercury-containing waste nationwide; Promote remediation of Hg contaminated sites; Ensure closure of mercury-containing material during transportation and storage. | At the sub-project area | Annually | Contractor and NMWT | Dependent on the amounts of mercury-containing wastes and contaminated sitesIncluded in the project cost estimate |
| Risk of inappropriate maintenance and operation of established equipment/ facilities and technology failure, which will result in excessive discharge of pollutants and environmental pollution. | Strict implementation of the project management systemUtilization of existing/ proven technologies and methodsWaste Management | Strict implementation of the project management system including adequate and appropriate maintenance, strict implementation of the operating manual, training of personnel on safety and operations.PPP to promote R&D, venture capital investment and technology transfer. ETV methodology to verify the performance of low-mercury and mercury-free alternatives. Demonstration low mercury BAT/BEPs in 3-4 coal-based VCM companies and trial application mercury-free alternatives in 1-2 coal-based VCM companies. Incentive program designed and implementation of major green instruments to allow the private sectors to access the technologies and experience gained from demonstrations. BAT/BEPs replication in 15 coal-based VCM companies national wide.During the project there will be the provision of training on hazardous materials as well as adoption of official policies for dealing with disposal of materials and environmental pollution. | At the sub-project area | AnnuallyAnnuallyAnnually | Contractor and NMWT, Site manager, in cooperation with Environmental and Social ConsultantContractor and NMWT, Site manager, in cooperation with Environmental and Social ConsultantContractor and NMWT, Site manager, in cooperation with Environmental and Social Consultant | 5000 $ GEF grantIncluded in the project cost estimate10,780,000 $ GEF grant66,480,000 $ co-financingIncluded in the Project cost estimateDependent on the amounts of wastes produced during the VCM ProjectIncluded in the Project cost estimate |
| **Additional risks identified during the project implementation** |  |  |  |  |  |  |  |

**4 Environmental and social sustainability monitoring**

**4.1 Monitoring Program**

The overall objective of environmental and social monitoring is to ensure that mitigation measures are implemented and that they are effective. Environmental and social monitoring will also enable response to new and developing issues of concern. Environmental monitoring will be carried out to ensure that all project activities comply and adhere to environmental provisions and standard specifications, so that all mitigation measures are implemented.

The proposed monitoring program is summarized in Table 4.1. The table lists the risks, parameters to be measured, monitoring methods and procedures used, timing/frequency of measurement, detection limit, definition of thresholds, sampling/monitoring location, and responsibility.

**Table 4.1 Environmental and sustainability monitoring**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **E&S risks** | **Parameters to be measured** | **Monitoring methods and procedures used (e.g. sampling)** | **Timing/Frequency of measurement** | **Detection limit** | **Definition of thresholds** | **Sampling/monitoring location** | **Responsibility** |
| **Risks identified during the PIF preparation and verified during the project preparation(PPG)** | Smoke emissions from the use of machines and dust production at replacing and updating phase, could result in annoyance to workers and pedestrians. | The concentration of total suspended particles (TSP), NOx, non-methane hydrocarbon(NMHC) | Sampling and analyze according to national guidelines | Weekly | 0.001 mg/m3 (TSP)0.01 mg/m3(NOx)0.12 mg/m3 (NMHC)0.2 mg/m3 (CO) | 1 mg/m3 (TSP)0.12 mg/m3 (NOx)4.0 mg/m3 (NHMC)3 mg/m3 (CO) | Boundary of construction field | Contractor  |
| Noise generation from the use of machines and equipment could pose impact on workers and pedestrians. | Noise levels on dB (A) scale | Sampling and analyze according to national guidelines | Weekly | 0.5 dB | 85 dB(A) for workers, 70 dB(A) for environment at daytime, 55 dB(a) for environment at night | Boundary of construction field | Contractor |
| Some replacing and updating activities such as the use of cranes, elevated working environments and machines might create health and safety risks for both workers and pedestrians for improper operation or accidents. | Monitoring to ensure proper use of cranes, elevated working environments and machines | Inspection and Risk assessment screening  | Daily | / | / | At the sub-project area | Site Manager |
| Noise resulted from the use of fan, air compressor and pump could potentially impact on workers. | Noise levels on dB (A) scale | Sampling and analyze according to national guidelines | Monthly as required by the supervision consultant | 0.5 dB | 85 dB(A) | At the sub-project area | Contractor |
| Climate change might affect the mobility of mercury to the atmosphere and sea. | Mobility of mercury to the atmosphere and sea |  Risk assessment | Throughout the VCM ProjectAnnually | N/A | N/A | At the sub-project area | Project Team |
| Risk of inappropriate maintenance and operation of established equipment/ facilities and technology failure, which will result in excessive discharge of pollutants and environmental pollution. | The concentration of pollutants discharged from equipment/ facilities records of maintenance and operation of equipment and facility | Sampling and analyze according to national guidelines  inspection | Throughout the VCM ProjectMonthlyThroughout the VCM ProjectDaily | Determined by national guidelinesN/A | Number of public consultations taking placeN/A | At the sub-project areaAt the sub-project area | ContractorSite Manager |
| **Additional risks identified during the project implementation** |  |  |  |  |  |  |  |  |

**5 Gender Issues**

**5.1 Background analysis**

The situation of women in China has improved significantly since the government established a gender equality policy in 1949, and the country has ratified the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW) in 1980, but has not yet ratified the Optional Protocol. . Education and labour force participation of women have since increased, while harmful practices (such as foot-binding of young girls) have been abolished and patriarchal norms have weakened. However, there is growing concern that the gap between men and women is widening again in the wake of China’s rapidly changing economic, social and political conditions. Large regional disparities are apparent, as rural women face more challenges than their urban counterparts. Women appear to be over-represented among the country’s poor, they are often discriminated against in the labor market and their political participation remains low. Women now contribute about half of household income, up from 20% in the 1950s. Furthermore, China has now become a real incubator for female billionaires. According to Forbes listing, only 14 women in the world have earned their own 10-figure fortunes in 2010, and half of them are from China. The Government has nearly achieved universal primary education, although this has proven more difficult in minority areas. Nationwide, the enrolment was over 96% in 2000, up from about 76% a decade earlier. Education achievements have increased substantially from 1990 to 2000 and gender gaps have narrowed, but are still very wide at the upper levels, with twice as many males as females with college-level or higher education. The PRC has made strides forward in improving its environment. However, the rising population and a burgeoning economy continue to stress the land and other natural resources. Water quantity and quality are deteriorating, and competition for water use is increasing. Land, water, humans, and biodiversity are all threatened by pollution and overuse of the environment. Reversing the losses is especially essential for women, who often bear the brunt of the burden for acquiring water for household and agricultural use, and may be left to deal with deteriorating agricultural land while men migrate to find paid labor elsewhere. The All-China Women's Federation, Consultation Center of China Association of Women Entrepreneurs, may be used as basis for further research on stakeholders and will be considered for inclusion in stakeholder consultations during project implementation.

Exposure to mercury is particularly dangerous for pregnant and breastfeeding women, as well as children, since mercury is most harmful in the early stages of development. Scientists found that even small amounts of mercury can interfere with brain development. Therefore, gender mainstreaming will be an integral part of this project.

As the object of the VCM Project is to achieve 50% reduction of mercury use in per unit production by the year 2020 (reference year 2010) and achieve 90% recovery of mercury in production processes, it is helpful to the health of women, as well as children. The cleaner production activities in the VCM Project can significantly improve the working conditions of the VCM synthesis plants in China, which is beneficial for the health of women working in the plants and also helpful to attract more women which generally like clean work conditions to be willing to apply for the jobs in the plants. So the VCM Project will certainly bring great benefits for women, as well as children. Greater gender equality in the VCM Project will provide significant social benefits to participating households and communities. There are many job opportunities in the VCM Project. Even in the labor-based replacing/updating work, women's jobs can include repairing potholes, cleaning ground, clearing tubular products, collecting maintenance materials, maintaining signage and so on.

**5.2 Gender mainstreaming action plan**

In order to maximize benefits to local populations and to ensure that men and women equally share the benefits, a gender mainstreaming action plan has been prepared which is shown in Table 5.1. Particularly in output 1.1, it will consider gender and especially gender related health issues during integrating the prevention and control of mercury pollution of PVC industry into relevant national. Additional, awareness raising materials will be prepared in output 5.2 targeted to children in kinder garden and women in their childbearing years, especially to those who live nearby mercury catalyst manufacture companies and VCM manufacture companies based on carbon carbide processes. Meanwhile, a specific topic on mercury exposure to women and children will be prioritized in training workshop for stakeholders in the same output. The key to enhancing women’s opportunities, and hence their position in VCM sector is to provide them with access to know-how, technologies and credit. In output 3.2, a training to upgrade women’s technological capabilities in VCM production is at the heart of enabling women to advance in more rewarding positions. Although cleaner technologies may exist in VCM sector, women may not have access to the credit to purchase them or the know-how on how to use them effectively and safely. In particular, women need improved access to credit to acquire cleaner technologies to operate the technologies in ways that optimize performance while minimizing pollution. In this project, participation of women will be one of key indicator for the training of cleaner production audit in output 2.3.

Table 5.1 Labor and Gender Mainstreaming Action Plan

|  |  |
| --- | --- |
| Project Component | Action Proposed |
| Component 1: Strengthen institutional, regulatory, and enforcement (IRE) capacity in VCM production in China | * Gender issues and especially gender related health issues will be considered in the national regulatory policy and regulatory frameworks developed to reduce and eliminate mercury use in the industrial VCM production, with focus on mandatory policy to ban use of the high-mercury catalyst
* Women/gender focused group will be consulted during phase of regulation revision/upgrading
* In the log framework, gender related qualitative information will be analyzed and tracked for national managerial capacity and enforcement capacity strengthened to coordinate and monitor the VCM production sector
* The training and awareness raising will ensure that both woman and men can participate in for national managerial capacity and enforcement capacity strengthened to coordinate and monitor the VCM production sector
 |
| Component 2: Promote technology transfer and investment for the widespread application of BAT/BEP | * A gender expert will be recruited for training and gender related tasks will be included in job descriptions and TORs.
* In the log framework, gender related qualitative information will be analyzed and tracked for demonstration of low-mercury BAT/BEPs
* The training and awareness raising will ensure that both woman and men can participate in for demonstration of low-mercury BAT/BEPs
* Participation of women will be one of key indicator for the training of cleaner production audit for demonstration of low-mercury BAT/BEPs
 |
| Component 3: Promote the recovery of mercury in mercury-containing waste from VCM production | * A training to upgrade women’s technological capabilities in VCM production
* In the log framework, gender related qualitative information will be analyzed and tracked for mercury recovery rate enhanced on mercury-containing waste nationwide
* The training and awareness raising will ensure that both woman and men can participate in for mercury recovery rate enhanced on mercury-containing waste nationwide
 |
| Component 4: Contaminated site identification and risk reduction associated with VCM production | * Further gender related risk assessment will be included in contaminated site identification and risk reduction associated with VCM production.
* Potentially affected groups will be consulted for the risk of mercury exposure.
 |
| Component 5: Information dissemination and awareness raising among stakeholders | * Awareness raised among government, private and civil society stakeholder groups will target children and women in their childbearing years, especially to those who live nearby mercury catalyst manufacture companies and VCM manufacture companies based on carbon carbide processes
* A specific topic on mercury exposure to women and children will be prioritized in training workshop for stakeholders and the training on gender issue will be set as an indicator
* The training and awareness raising will ensure that both woman and men can participate in for awareness rising among government, private and civil society stakeholder groups
* The budget for the training on gender issue was allocated
* In the log framework, gender related qualitative information will be analyzed and tracked for raise awareness among government, private and civil society stakeholder groups
 |
| Component 6: Monitoring & Evaluation | * Gender focused associations and organizations will be consulted throughout the project implementation
* A gender maker will be updated at the output level when the approved project document is uploaded in SAP PPM system.
* Gender responsive indicators, targets and baselines will be incorporated into the results framework
* Sex disaggregated data and qualitative information will be collected and analyzed to monitor the gender situation in China.
* Trainings on gender issues will be conducted to sensitize project assistances.
* The project staff will have a gender mainstreaming briefing to inform on UNIDO’s gender policies.
* Gender balanced recruitment of project personnel and gender balanced representation in project committees will be taken consideration during the project implementation and the project managers and assistants at the national executing agency, FECO/MEP have a quite good gender balanced representation.
* The gender issue will be one of the criteria of the mid-term review and the terminal evaluation in UNIDO.
 |

**6 Capacity development**

**6.1 Identification of capacity needs**

The effectiveness of the ESMP greatly relies on the capacity of the institutions and staff involved in the implementation of the project. Therefore, ESMP must assess the institutional and staff structure and capacity to successfully implement mitigation and monitoring measures, as well as recommend measures to strengthen institutions and build staff capacity, as needed.

This is the first time for FECO to apply ESSPP in the project funded by GEF. Though FECO have implemented some projects funded by GEF, there is no institutional arrangement and the corresponding responsibilities designed for the conduction of ESMP implementing these projects. So there is obvious lack of awareness of ESSPP by FECO Staffs and Managers, and some Chinese contractors. Moreover, there will be multi-fold environmental and social aspects in the VCM Project. So there should be institutional arrangements and the corresponding responsibilities designed for successfully implementing ESMP. Also, all those are responsible for management, implementation and operation of any aspect of the ESMP shall be adequately trained for their role. Training records shall be maintained on site, for each employee, to provide evidence for monitoring and evaluation purposes.

**6.2 Capacity development plan**

**6.2.1 Institutional Arrangements and Responsibilities for implementation of ESMP**

The VCM Project is funded by the GEF which is represented by UNIDO. The MEP, the executing agency, is represented by the FECO. The FECO will manage the VCM Project on behalf of the MEP through the National Mercury Project Team (NMPT), led by a Project Manager (PM). The PM, supported by the NMPT, has overall responsibility for the execution of the VCM Project. The Project Manager is a member of the FECO and reports to its Director.

The National Mercury Project Team (NMPT) will hire an Environmental and Social Consultant, a Gender Expert and a site manager to manage ESMP.

The execution of the VCM Project within the project area will be done by individual Contractors and the implementation of each VCM Project Component System is the responsibility of the respective Contractor through their Contractor implementation Team.

The implementation of the VCM Project ESMP is the collective responsibility of the PM, NMPT, Environmental and Social Consultant, Site manager and the selected Contractors.

**6.2.1.1 Project Manager**

The PM has overall responsibility for the execution of the project and compliance with the VCM Project Goals and Environmental Policy in China and the VCM Project ESMP. The PM is supported by specialists, engineers, financial/accounting officers, procurement officers, environmental and safety officers a gender expert and public relations officers. The Project Manager reports to the Director of the Executing Agency.

**6.2.1.2** NMPT

The NMPT is responsible for

* Conducting and providing evidence of meaningful consultation (i.e., consultation that is free, prior and informed) with communities likely to be affected by environmental and social impacts, and with local stakeholders, and also for ensuring broad community support.
* Overseeing environmental and social assessment studies that need to be undertaken prior to project appraisal. These studies will identify and assesses the potential opportunities for, risks to, and impacts including direct, indirect, cumulative and pre-mitigation impacts.
* Applying the mitigation hierarchy: to avoid potentially adverse impacts; if avoidance is not possible, to reduce and minimize potential adverse impacts; if reduction or minimization is not sufficient, to mitigate and/or restore; and as a last resort to compensate for and offset.

**6.2.1.3 Environmental and Social Consultant**

Environmental and Social Consultant is responsible for team direction and ensuring that the project is implemented according to all the design requirements and technical specifications. Consultant on Environmental and Social management plan reports to the PM.

Environmental and Social Consultant will be required to:

* Undertake Environmental and Social screening
* Update and manage the project ESMP
* Review and approve and Environmental procedures, prepared by the contractor and identify any areas for improvement
* Review and approve monitoring schedules of Contractors
* Evaluate the environmental competence of all contractors working on the project
* Verifying contractor environmental performance and compliance with the VCM project goals
* Manage and monitor the implementation of the project social standards in line with UNIDO/GEF guidelines
* Conduct environmental audit of contractors
* Act as a main point of contact between the contractor and NMWT on environmental issues

**6.2.1.4 Gender Expert**

Gender Expert is responsible for gender issues in the VCM Project and reports to the PM.

Gender Expert will be required to:

* Ensure gender integration during demonstration and replication phase of this project and analyze in cooperation with specialized organizations in China potential risks for affected communities
* Refine gender related indicators, guide planned consultations
* Provide inputs to mitigate health risks for woman and for potentially affected groups
* Contribute to the design of a strategy proposal for the reduction of health risk and environmental impact and remediation
* Undertake training on project staff about gender issues and conduct gender related assessment
* Collect and analyze sex disaggregated data and qualitative information to monitor the gender situation in China
* Analyzed and track gender related qualitative information in the log framework
* Consider other gender issues in the VCM Project and make relevant suggestions to PM.

**6.2.1.5 Site Manager**

The Site Manager is responsible for team direction and ensuring that project is implemented according to all the design requirements and technical specifications. The Site Manager reports to Project Manager.

Site Manager will be required to:

* Review and approve the plan for updating of existing facilities and replacing of current equipment.
* Approve monitoring and audit schedules
* Verify contractor environmental performance and compliance with the project goals
* Monitor project activities to ensure that control measures are effective and ensure compliance with the ESMP
* Prepare monthly and other status reports on environmental monitoring, activities, compliance, etc.
* Coordinate with NMWT and contractors to ensure that environmental risks are identified and appropriate controls are developed
* Coordinate environmental training for site personnel and contractors
* Manage the environmental monitoring program
* Provide oversight and instruction to site personnel on environmental matters to ensure compliance with the ESMP
* Undertake inspections, initiate actions, complete environmental inspection report according to schedule
* Ensure correct procedures are followed in the event of an environmental incident
* Maintain training register, identify training needs and provide training where required

**6.2.1.6 Contractors**

It is projected that a number of contractors will be contracted to assist the accomplishment of the activities of the VCM Project including the conduction of ESMP. Contractor will be required to:

* Subscribe to the goals and objectives of environmental management procedures set for the VCM Project and the environmental goals and objectives of the ESMP
* Comply with all of the negotiated project requirements
* Comply with the contractor policies, procedures and systems
* Report to the Site Manager and Environmental and Social Consultant any Incident/accident and the corrective action undertaken.
* Participate in training, induction programs and review programs as required
* Attend performance meetings as directed by NMWT

**6.2.2 Plan for strengthening capacities of each organization**

The following training shall be considered for each organization.

**6.2.2.1 NMPT**

The NMPT shall designate environmental staffs to oversee the preparation, implementation and oversight of the ESMP and its associated sub plans. The environmental staffs shall be provided with enough technical and financial resources to complete this oversight role; external resources or contractors may be required. Specific training to the environmental staffs should be provided as follows:

* UNIDO environmental and social safeguards policies and procedures;
* Environmental and social management plans;
* UNIDO gender policies and other gender issues in the VCM Project
* Specific topic on mercury exposure to women and children
* Fundamentals and process of VCM synthesis
* Environmental protection associated with construction and operation of the VCM Projects.

**6.2.2.2 Environmental and Social Consultant**

Specific training to the Environmental and Social Consultant should be provided as follows:

* UNIDO environmental and social safeguards policies and procedures;
* Principles and procedures for environmental and social impact assessment;
* Environmental and social management plans;
* UNIDO gender policies and other gender issues in the VCM Project
* Specific topic on mercury exposure to women and children
* Compliance assessment, monitoring and follow-up;
* Air, soil and water sampling procedures;
* Wastewater treatment and air pollution control;
* Waste and hazardous materials management;
* Fundamentals and process of VCM synthesis;
* Environmental protection associated with construction and operation of the VCM Projects.

**6.2.2.3 Site Manager and Contractors**

Specific training to the Site Manager and Contractors should be provided as follows:

* UNIDO environmental and social safeguards policies and procedures;
* Environmental and social management plans;
* Training to upgrade women’s technological capabilities in VCM production
* Specific topic on mercury exposure to women and children
* UNIDO gender policies and other gender issues in the VCM Project
* Environmental regulations and acts;
* BAT/BEPs;
* Air, soil and water sampling procedures;
* Wastewater treatment and air pollution control;
* Waste and hazardous materials management;
* Fundamentals and process of VCM synthesis
* Environmental protection associated with construction and operation of the VCM Projects.

**7 Communication**

The affected communities and stakeholders should be consulted about the draft ESMP. Appropriate consultations with potentially-affected groups – including local communities, and women and men of different ages, ethnicities and status – will be carried out as early as possible in the process, to solicit their informed participation in project design and as a basis for continuing consultations to address issues that may affect them over the course of the project. There will be some formal consultations to address the programmatic issues and impacts established in the VCM Project environmental and social screening. The scheduled consultations are listed in Table 6.1, Scheduled Consultations for Each Program Area.

Documentation of screening and categorization of the project must be disclosed publically prior to proceeding with the appraisal. Since project affected people may not have reasonable access to the UNIDO website, the project development team is also required to release locally the decision, and the results of any consultations, translated into the local language, in a culturally appropriate manner, to facilitate awareness by relevant stakeholders that the information is in the public domain for review. This local release should occur in a reasonable timeframe (generally within 30-60 days after completion of the ESMP).

Presentation of information produced as a result of impact assessment procedures is governed in general by UNIDO GEF Environmental and Social Safeguards Policies and Procedures:

* Draft ESMP is placed on the UNIDO website, 10 working days prior to consultation;
* Final ESMP is placed on the UNIDO website, 10 working days prior to consideration by UNIDO’s Appraisal Decision Point.

Furthermore, all other disclosures related inter alia to draft Environmental and Social Impact Assessments, ESMP, mitigation plans, screening reports, results of all stakeholder consultations and other documents will be made available in a timely manner in a place accessible to key stakeholders.

Table 7.1 Consultations for Each Program Area

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Consultation | Purpose | Participants | Lead/Chair | Reporting | Schedule |
| Initial | Project Start up:* Project Overview
* Project Organization
* Project Schedule
* Social and Env Impacts
* Risk of mercury exposure
* ESMP
 | Stakeholder group, the VCM project management, contractor management teams, potentially affected groups | The VCM Project management | Stakeholder Groups in each Project Area within one month after consultation | 15 - 30 days before Schedule Start of Construction |
| Public consultation& site visit | * Adjusting of mitigation measures, if necessary;
* Impact of replacing and updating activities;
* Comments and suggestions
 | The VCM project management, contractor management teams, residents adjacent to components, representatives of social sectors  | Contractor management team | Stakeholder Groups in each Project Area within one month after consultation | 2times: 1 time before the project commences and 1 time after completion of replacing and updating activities |
| Public consultation& site visit | * Effectiveness of mitigation measures;
* Impacts of project implementation;
* Risk of mercury exposure
* Comments and suggestions.
 | Contractor management teams, residents adjacent to components, representatives of social sectors, supervision teams, potentially affected groups | Contractor management team | Stakeholder Groups in each Project Area within one month after consultation | Once in the first year at the stage of the project implementation |
| Expert workshopor pressconference | * Comments and suggestions on impacts;
* public opinions
 | Experts of varioussectors, media, supervision teams | The VCM Project management | Stakeholder Groups in each Project Area within one month after consultation | As needed based onpublic consultation |
| Addressing Community Concerns | Consultation on Grievance Procedure | Stakeholder group, supervision teams, contractor management teams, representatives of social sectors | Consultant with support from the VCM Project Management | Stakeholder Groups in each Project Area within one month after consultation | Within 90 days from start of construction. |

As part of the GEF Annual Monitoring Report (AMR), UNIDO will annually communicate implementation progress on issues that involve ongoing risk to or impacts on the project stakeholders, and on issues that the consultation process or grievance mechanism has identified as of concern to those stakeholders. The ESMP and the relevant progress reports (PIRs) will be disclosed on the UNIDO public website, under the following link: <https://open.unido.org/index.html>