

GUIANAS SUSTAINABLE NATURAL  
RESOURCES MANAGEMENT PROJECT

**WWF-GUIANAS**

***Guyana Geology and Mines  
Commission***

*(PROMOTING OF SUSTAINABLE GOLD MINING IN THE  
SMALL AND MEDIUM SCALE SECTOR IN GUYANA)*

*Agreement No KR 27*

***FINAL TECHNICAL REPORT***

**PERIOD: November 1, 2007  
to February 28, 2010**



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## PROMOTING OF SUSTAINABLE GOLD MINING IN THE SMALL AND MEDIUM SCALE SECTOR IN GUYANA

|                                   |   |
|-----------------------------------|---|
| <b>Goal</b>                       | To promote sustainable use and management of resource in the small and medium scale gold mining sector in order to reduce pressure on priority ecosystems.  |
| <b>Overall Objectives</b>         | <ol style="list-style-type: none"> <li>1. To foster stakeholder inputs to improve/develop appropriate policies, regulations, legislation for better management of the environment in the mining sector;</li> <li>2. To assess and demonstrate the best practices to the sector to reduce environmental impacts and maximise benefits;</li> <li>3. To increase public awareness of the environmental and pertinent issues that relate to mining and its associated impacts and promote alternatives;</li> <li>4. To assess mercury and other related impacts of the sector on the environment;</li> <li>5. To strengthen the monitoring and enforcement mechanisms related to the regulatory agency.</li> </ol>  |
| <b>Project Activities Summary</b> | <p>Meetings held with the GGDMA, GGMC staff miners and communities. Reconnaissance visits also were undertaken as one sought to determine the best approach to approach training aimed at improved compliance with existing mining laws and regulations. Training was done to equip officers as trainers in critical aspects of the regulations with the intent of equipping them to training miners to achieve an increased level of compliance.</p> <p>A survey was done to determine the level of knowledge and awareness of officers and miners of Environmental Management, Occupational Health and Safety and a range of mining related issues. Training materials were prepared and training conducted considering, among other things, the findings of the survey.</p> <p>Training was done to equip officers as trainers in Environmental Impact Assessment Social Impact Assessment and Environmental Management System.</p> <p>A document that is expected to be the final draft of the occupational health and safety regulations for mining was prepared and circulated for internal review.</p> <p>One infill water quality survey was done, adding more background data to the existing information. We were hoping to include personnel from Surinam in the team conducting this survey arrangements did not proceed as expected.</p> <p>The Mercury analyser was used to assess the mercury content in the air around the Commission, correlation it with the activities of the Gold Board Laboratory. The Commission took the initiative to examine its own space and be an example as mitigation measures were considered.</p> <p>Several pieces of mineral processing equipment were purchased. Among these were a shaking table and vibrating screen. These pieces of equipment were operated in the field to demonstrate their ability to recover gold without the use of mercury. Field trials were done demonstrating the use of equipment which should reduce dependence on mercury for gold recovery.</p> <p>Education and Awareness activity was woven into the Environmental Management and the Concession and Compliance Monitoring Training activities. The stakeholder workshops were not held as planned after core activities.</p> |

## I. INTRODUCTION

The Promoting Sustainable Mining In the Small and Medium Scale Gold Mining Sector in Guyana project, sought to reduce pressure on the priority ecosystems of Guyana. This project started at the GGMC in November 2007 with the focus intended to be on promotion of dialogue with all stakeholders aimed at increasing awareness of the impacts of mining activities and a sense of partnership in the mission to mitigate the effect on the environment and some aspects of community life. Every effort was made to synchronise project activities with those of GGMC. The common goal remained the achievement of better environmental performance and sustainable activity. The thrust however was on the promotion of prevention and proactive behavior through education and training activities coupled with demonstration of best practices.

In the implementation of this project one attempted to identify and focus on a number of core activities. These activities were thought to have direct impact on the regulator, the mining sector, mining communities and in general the image of small and medium scale mining. Other activities would reinforce the gains made here. All these core activities were initiated but only three were completed. Others were started and were at various stages of progress. Arrangements have been made for the remaining to continue within the Commission after the project comes to a close since they are considered to be of value to the sector.

The Commission, the Guyana Gold and Diamond Miners Association, Miners and mining communities benefited from this project. It was unfortunate that the Community Support Engineer could not have been hired since his /her work would have extended the reach of the project further into the hinterland communities. The training received by GGMC officers, as trainers in Environmental Management and Concession and Compliance Monitoring, should go a long way in filling this void.

The fees consultants request presented some challenge. The sums the project budgeted for consultants was much to low to accommodate the fee requests. A compromise position was worked out in which a number of activities were grouped under one consultancy. As such we were able to achieve a lot through the consultant having their input spread across a number of related activities.

## II. ADMINISTRATION

| Financial Summary         | Period     |
|---------------------------|------------|
| Actual Expenditures (WWF) | 21,162,320 |
| Approved Budget (WWF)*    | 21,162,793 |
| Total Expenditures        | 26,724,400 |
| Total Budget              | 30,000,000 |

The actual expenditure shown here is a portion of the total expenditure incurred during the course of the project. The Guyana Geology and mines Commission funded the activities of the project since March 2009. In November 2009 a portion of its expenditure was reimbursed. Funds were left in the project account to keep it above the minimum balance so it would not incur any penalty. The commission continued to fund activities that were initiated by the WWF project. The funds requested represents the cost of some of the activities that were paid for by the Commission. The total expenditure represents all the funds used by the project within the limit of the budget lines up to February 2010 – the actual expenditure as shown above along with the funds requested for the reimbursement of the Commission.

### III. TECHNICAL ASSISTANCE

No technical Assistance was requested.

### IV. PROJECT ACTIVITIES/ PROJECT ACCOMPLISHMENTS

The Promoting Sustainable Mining In the Small and Medium Scale Gold Mining Sector in Guyana project, hereafter referred to as the GGMC WWF Project, was able to implement all project activities to various stages of completion.

#### 1. Development of Appropriate/Improved Policies, Regulations, Legislation for Better Management of the Environment in the Mining Sector

The development of new legislation within the time frame of this project was not practical. As such the project undertook the sponsorship of completion of draft legislation related to the improvement of the management of the mining industry, working with the Commission to finalise and see them through to enactment into law. This aspect of the project was handled by the legal advisor on the Commission. The two pieces of legislation under consideration was the mining (Administrative) Regulations and the Mining (Occupational Safety and Health) Regulations. The latter was revised based in inputs from consultations with stakeholders. What is expected to be the final draft was prepared. The decision was taken to review this draft internally before submitting same to the Ministry of Labour to be taken through the final stages of enactment into law. Parallel to activity at the Ministry of Labour is expected to be education and awareness activity related to these regulations.

#### 2. Improved Management and Monitoring of the sector.

The greater part of this activity was undertaken under the Concession and Compliance Monitoring Training and the Environmental Management Training consultancies. A large proportion of the commissions field staff were trained as trainers in Environment Management with emphasis on Environmental, Impact Assessment, Social and Environmental Management Systems. At her own expense the Environmental Management Training consultant engaged assistants to ensure that all the tasks required by the consultancy are completed satisfactorily.

Officers were also trained as trainers in Concession and Compliance Monitoring. Under the guidance of the respective consultants the training of miners and community members was taken to the field by the officers. A booklet for Small and Medium Scale Miners was also prepared. This booklet was reviewed extensively by GGMC managers to ensure accuracy and balance of both content and presentation. This booklet, to date, has not been published

The opportunity was taken to review the knowledge attitudes and perception of officers and miners and the general level of awareness of the impact of mining on the environment through surveys and reconnaissance visits to mining areas and nearby communities. A number of reports were prepared for documentation of these activities. Reports included several recommendations for the improvement of the Commission's performance in the management and monitoring of the sector coming from both the consultants and the participants in the training activities.

#### 3. Adoption of Best Practices in the Sector

The project contributed to the Commission's Mineral Processing program. Several pieces of mineral processing equipment were purchased Arrangements are being made to mineral processing equipment identified as part of the transportable demonstration unit.

Demonstrations in Mahdia, using the screens and shaking table purchased through this project, were sponsored by the project. These demonstrations both in Mahdia and at the Mining Week exhibition site generated a lot of interest in this piece of equipment which is meant to improve processing efficiency as well as reduce mercury consumption.

Thirty relorts were purchased for free distribution. This program did not proceed as planned. The areas for free distribution were not identified. A modified approach is under consideration.

#### **4. Reduced Land Degradation and Improved Discharge Water Quality**

Water quality survey was done toward s the end of the project. This added to the background information available to the Commission and would allow better assessment of the impact of mining on the environment.

Measurement of mercury concentration in air, using the Lumex RA 915+ Mercury Analyser, commenced on February 13, 2008. Measurements were started by Senior Environmental Officer Mr C Todd. This activity sought to assess the impact of the Gold Board Laboratory's activity on the atmosphere within and just outside the limits of the Commission. This activity was continued by two environmental monitoring assistants hired by the Commission. Routine measurements of mercury in the atmosphere were done at various locations within and around the GGMC compound. Efforts were made to relate the results to the level of activity at the laboratory.

On completion of the stint of the environmental monitoring assistants mercury analysis continued using a combination of personnel from the Environmental Division and the GGMC laboratory. The air quality in the vicinity of the Gold Board's operation in Bartica was also checked. The results were reviewed. Steps were taken to reduce the concentration of mercury in the atmosphere where it was found to be high. Since then the Gold Board initiated the purchase of a scrubber to remove mercury from their emissions.

#### **5. Environmental Education and Awareness**

Environmental Education and Awareness was incorporated in the Concession and Compliance Monitoring and the Environmental Management Training activities. As activities were taken to the field every opportunity was taken to raise awareness and get miners and community members to consider ways of minimising impacts on the environment. The surveys and reconnaissance visits indicated the areas needing the most attention. These were addressed in subsequent activities.

The stakeholders workshops were not done as planned after major training activities and field interventions. The advent of the Low Carbon Development Strategy (LCDS) launched by the Government of Guyana demanded the attention of all the groups and agencies we were targeting. Some alternative approaches were considered but could not be completed within the project schedule.

The project sponsored the erection of billboards promoting the consideration of the regulations and best practices at interior locations.

#### **V. TRAVEL**

Only trips to mining areas were undertaken.

#### **VI. CONCLUSIONS**

The Small and Medium Gold Mining Sector continued to be quite buoyant with the increase in gold prices over the last three years. It allowed persons to exploit low grade ore and tailings of previous workings

which hitherto would have been considered uneconomical to mine. One also saw the entry into the sector of large numbers of investors because of the promise of good returns in this boom period. This scenario increased the challenge to the commission as it sought to fulfill its mandate. The support of the World Wildlife Fund was welcome as the commission sought to work through this period of change.

The commitment of the Guyana Geology and Mines Commission to the Promoting Sustainable Gold Mining in the Small and Medium Scale Sector of Guyana project was without question. The Commission supported the activities of the project throughout. As far as practicable the project activities were integrated into the Commission's work program and work flow. This proved to be quite a challenge since the Commission sought to pursue a very ambitious program which usually utilized all of its field staff. This does not include the emergencies that would arise from time to time that would require immediate response and usually diverting staff from planned activities.

In implementation we managed to complete three of the seven core areas identified. At the end of the implementation period the others were at various stages of progress. These activities will be pursued by the commission having acknowledged their value.

Legal aspects of the project were not implementable as set out by the original project outline. The change requested sought to adjust the program to include activities that would bring into force laws that would improve the operation and management of the sector that are already in draft. The Mining Occupational Safety and Health Regulations had already been subjected to several rounds of consultation and could be finalized within the time of the project.

We were working with personnel from Surinam to arrange exchange visits. These exchanges would have allowed discussion on harmonization of legislation as well as for sharing of knowledge and experiences in environmental management, particularly in the execution hydrological and sedimentological surveys. Unfortunately we were not able to conclude these arrangements. But still hope that the Guyana Geology and Mines Commission and Geology and Mines Department of Surinam can work together and make this kind of interaction a reality.

Capacity building activities were undertaken by with the help of consultants. Training was done in Environmental Management and Concession and Compliance Monitoring. Officers were trained as trainers in the above mentioned areas and are now capable of passing their knowledge on to their peers (who were not exposed to training because they were unavailable at the time of training), miners and community members. We expect this training to contribute significantly to the efforts to operate sustainably in the Small and medium scale sector. We were particularly grateful to the consultants for their effort to ensure that a high quality of training was delivered.

The survey of officers and miners and the reconnaissance visits to mining areas and communities provided useful background information for the development of the curriculum for training. It also gave the commission an updated perspective of the perception of officers and miners and their views on a range of issues.

The assessment of mercury contamination in the environment was done mainly in the commission since the gold board laboratory is a major refiner of gold is located here. The Lumex RA 915+ analyser was used to assess the mercury content of the atmosphere at various locations within the commission. An attempt was made to correlate the results with the activity at the laboratory. Information gathered will be useful in the in the assessment of the performance of the new system since the the air quality along with some correlation with activity before the installation of the new scrubber was determined. The effect of mercury in the atmosphere on the employees within the commission was not established. No mercury in blood tests were done.

Development of environmental management databases were not pursued directly but activity was initiated to develop the framework for managing all the Commission's information and data and as such would include environmental management information and data. Steps are being taken to develop an Integrated Enterprise Information System for the management of the Commission's information. To this end a System Requirements Specification document to inform the design of this system was due to be prepared.

The advent of the Low Carbon Development Strategy (LCDS) resulted in the review of proposals for the forums with stakeholders. These sessions were scheduled to be held after a number of core activities were completed. Several interagency and stakeholder discussions were held to discuss the implementation of and implications of the LCDS. The forums associated with the project were therefore reconsidered.

Amerindian communities were engaged during the Concession and Compliance Monitoring reconnaissance visits. We noted some of their ambitions and aspirations including their desire to benefit from the gold and diamond mining industry. An attempt was made to engage a Hinterland Community Support Engineer to assist them in interfacing with the industry. The advertisements did not attract any applicants. An alternative approach for assisting these communities will be developed. In the interim the trained GGMC officers can work with the communities whenever possible.

Assistance with mineral processing was a critical part of this project for assessing and demonstrating improved recovery methods particularly those which do not require the use of mercury or minimizes the use of mercury. A number of pieces of equipment were bought and a field demonstration campaign was sponsored by the project. The demonstrations were well received. Attempts at adopting alternative methods are few and are made mainly by the larger and better established miners.

It was recognized that the activities of the project promised and delivered significant benefits to the Commission. The commission did their best to embrace the project in a situation where project activities had to compete with the many demands of the relatively small staff in a demanding situation. The challenges faced by the commission in maintaining order in the sector should not be underestimated. The intervention of the World Wildlife Fund was timely and one hopes that the Guyana Geology and Mines Commission and the World Wildlife Fund continue to support each other recognizing the challenges associated with their respective mandates.

## VII. ANNEX 1

### Publications/Materials Produced by the Project

1. Report on Miners' Survey - Paulette Bynoe - Consultant Environmental Management Training April 2009
2. Report on Geology and Mines Officers' Survey - Paulette Bynoe - Consultant Environmental Management Training April 2009
3. Training Materials for Miners - Paulette Bynoe - Consultant Environmental Management Training July 2009
4. Training Materials for Guyana Geology and Mines Officers - Paulette Bynoe - Consultant Environmental Management Training April 2009
5. Report on Training Workshop on Environmental Management - Paulette Bynoe - Consultant Environmental Management Training October 25, 2009
6. Post Evaluation of Training Workshop # 1 of Geology and Mines Commission Officers - Paulette Bynoe - Consultant Environmental Management Training November 14, 2009
7. Post Evaluation of Training Workshop # 2 of Geology and Mines Commission Officers - Paulette Bynoe - Consultant Environmental Management Training December 5, 2009
8. Report on Training of Miners in Environmental Management and Environmental Management Systems by GGMC Officers - Paulette Bynoe - Consultant Environmental Management Training



December, 2009

9. Environmental Management Systems Framework for Small and Medium Scale Mining Operations in Guyana - Paulette Bynoe - Consultant Environmental Management Training December, 2009
10. Report on Environmental Management Training Consultancy - Paulette Bynoe - Consultant Environmental Management Training November 14, 2009
11. General Report - Environmental Management and Concession and Compliance Monitoring Training Workshop 1 - Lennox Tucker October 2009
12. General Report - Environmental Management and Concession and Compliance Monitoring Training Workshop 2 - Lennox Tucker November 2009
13. Phase 1 Report – Concession and Compliance Monitoring Training (Assessment of the Small and Medium Scale Mining Sector and arrangements for regulation) – Samuel Wright – Consultant Concession and Compliance Monitoring Training March 2009
14. Phase 1 Report – Concession and Compliance Monitoring Training (Assessment of the Small and Medium Scale Mining Sector and arrangements for regulation) – Samuel Wright – Consultant Concession and Compliance Monitoring Training March 2009
15. Training Workshop Power Point Presentation with notes - Samuel Wright – Consultant Concession and Compliance Monitoring Training July 2009
16. Report Officer Training September 24, 2009 to November 14, 2009 - Samuel Wright – Consultant Concession and Compliance Monitoring Training November 2009
17. Guidelines for the use of Concepts associated with the Codes of Practice for Environmental Management - Samuel Wright – Consultant Concession and Compliance Monitoring Training December 2009
18. Summary Report – Concession and Compliance Monitoring Training - Samuel Wright – Consultant Concession and Compliance Monitoring Training December 2009
19. Environmental Management Booklet for Medium and Small-Scale Miners Samuel Wright – Consultant Concession and Compliance Monitoring Training September 2009.

## **B. Press Articles about the Project**

No press article were done

## **C. Photographs**

Photographs are included in the reports listed above.

## IMPLEMENTATION SCHEDULE

| Activities   | FY<br>08<br>Q2 | FY<br>08<br>Q3 | FY<br>08<br>Q4 | FY<br>09<br>Q1 | FY<br>09<br>Q2 | FY<br>09<br>Q3 | FY<br>09<br>Q4 | FY<br>10<br>Q1 | FY<br>10<br>Q2 | FY<br>10<br>Q3 | FY<br>10<br>Q4 |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1.1.1 Facilitate Consultation Workshops for Policies and Regulations revisions and enacting amendments by end of August 2009       |                |                |                |                |                |                |                |                | O              |                |                |
| 1.1.2 Compile draft report on workshops for policies and regulation revision by end of September 2009                              |                |                |                |                |                |                |                |                | O              |                |                |
| 1.1.3 Finalise and circulate draft on policies and regulation revision by January 2010   |                |                |                |                |                |                |                |                |                | O              |                |
| 1.1.4 Exchange visits between Guyana and Suriname for discussion on harmonisation by end of December 2009.                         |                |                |                |                |                |                |                |                | O              |                |                |
| 1.2.1 Workshop for miner and community representatives to review compliance and facilitate dialogue by end of March 2009           |                |                |                |                |                | O              |                |                |                |                |                |
| 1.2.2 Revision of codes of practise, inspection manuals, Checklists, and monitoring programs. by end of March 2009                 |                |                |                |                |                | O              |                |                |                |                |                |
| 1.2.3 Prepare and disseminate among miners and the community representatives finalised compliance documents by end of October 2009 |                |                |                |                |                |                |                |                |                | O              |                |
| 2.1.1 Conduct training programs in water quality management by end September 2009  |                |                |                |                |                |                |                |                | O              |                |                |
| 2.1.2 Conduct training in Environmental and Social Impact assessment by end of September 2009                                      |                |                |                |                |                |                |                |                | O              |                |                |





B. Press Articles about the Project

No press article were done

C. Photographs

Photographs are included in the reports listed above.