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San Isidro, December 15, 2005

Mr. Engineer  
JULIO BONELLI  
Director General of Mining Environmental Affairs  
Ministry of Energy and Mines  
By hand

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MINISTRY OF ENERGY AND MINES  
Document Management Office  
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Dear Sir:

As per the provisions of Supreme Decree No. 046-2004-EM, we are hereby requesting an **exceptional extension** of the time frame for one of the projects in our PAMA for the La Oroya production Unit, the one called Sulfuric Acid Plants Project, for an additional four-year period. To this end we are attaching to the request the documentation that the aforementioned precept requires, which we now list below:

- Description of the Sulfuric Acid Plants project (For which the extension is being requested) including the following in such description:
  - \* Costed performance schedule that details each one of the activities to be performed in the Acid Plants project
  - \* The investment budget for the Acid Plants project
- The specific list of environmental goals and objectives, containing the time frames for achieving them
- The Monitoring Program and follow-up with citizen participation.
- Audited financial statements for the years 2000, 2001, 2002, 2003, and 2004, including the explanatory notes to the balance sheet and a debt level report, indicating when loans come due, detail of creditors, origin of debts and guarantees, as well as the special commitment and default clauses.
- Minutes of 4 information workshops held in La Oroya Antigua, Paccha, Huari, and Santa Rosa de Sacco.



- Minutes of 3 public hearings held in La Oroya Antigua, Paccha, and in Sapallanga – Huancayo.
- Health Risk Analysis Study performed by the consulting firm Integral Consulting Inc., to which is attached the opinion from the General Department of Environmental Health DIGESA and a supplemental report from Integral Consulting Inc.
- Copy of the delivery receipts from the Health Risk Analysis to the Regional Government of Junín and the Provincial Council of Yauli – La Oroya, which was delivered to each institution together with the full request for the exceptional extension of the Sulfuric Acid Plants project.
- Environmental trust project cited in Art. 6 of Supreme Decree 046-2004-EM, which is confirmed by Banco Wiese Sudameris, which will act as trust company.

It must be indicated that, as a result of the Health Risk Analysis, it has been determined that there is a significant source of contamination that was not being controlled within the original PAMA, which corresponds to the Fugitive Emissions. The fugitive emissions are comprised of the dust that escapes the operation, either through doors, windows, skylights, and other openings in the plants' buildings.

The risk analysis study estimates that each gram of dust that escapes as a fugitive emission has an effect seven times greater on the air quality than that of a gram of dust that vents through the stack. The impact of fugitive emissions being significantly greater, it is imperative that priority be given to their treatment. To handle the problem of the fugitive emissions, we have included in our proposal the performance of three supplemental projects aimed at reducing dust, which would be completed by the end of 2006. Those projects are:

- Reduction dust emission through the stack
- Reduction of fugitive emissions
- Complementary projects

With the execution of these complementary projects the main causes of health risks to the populations will have been reduced or eliminated by the end of 2006. Likewise, the industrial and household solid waste control projects and



those to control liquid industrial and household discharges into rivers will also be completed by the end of 2006.

It must be indicated that only control of sulfur gases will remain outstanding after 2006; which we will be reducing gradually. The first reduction in sulfur gases will take place upon completion of the zinc circuit sulfuric acid plant at the end of 2006. A second and significant reduction will take place at the end of 2008, with the completion of the sulfur acid plant for the lead circuit and with the installation of the acid plant for the copper circuit at the end of 2010 we will be complying with the LMPs.

The extension proposal that we submit for your approval will allow a greater reduction to the risk of the population's health to be achieved than what was going to be obtained with the full performance of the original PAMA at the end of 2006. In addition, the company reiterates its commitment to continue working in coordination with other public and private institutions; as well as with the communities in its surroundings to continue to reduce the levels of health risks.

With nothing further for the time being, I remain

Sincerely,

[signature]

José Mogrovejo  
Corporate Vice President  
for Environmental Affairs



**DOE RUN PERU**

*La Oroya Division*

**METALLURGICAL COMPLEX  
OF LA OROYA**



**REQUEST FOR AN EXCEPTIONAL  
EXTENSION OF DEADLINE TO COMPLETE  
THE SULFURIC ACID PLANTS PROJECT**

*December 2005*

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# 1 EXECUTIVE SUMMARY

## 1.1 INTRODUCTION

The operations of the metallurgical complex of La Oroya began in 1922, dedicated to processing polymetallic sulfurous concentrates to obtain refined metals, such as silver, lead, copper and zinc, with consequent environmental impacts. These impacts were not given proper consideration due to the lack of national environmental legislation, up until 1994, when the Peruvian State defined its policies on environmental control for the mining and metals sector, almost 80 years after the metallurgical complex had commenced operations.

On October 24, 1997, Doe Run Peru S.R.L. (DRP) began running operations of the metallurgical complex of La Oroya and undertook the commitment with the Peruvian Government to execute the projects included in the “*Programa de Adecuación y Manejo Ambiental*” (Environmental Adaptation and Management Program or “PAMA” as per its initials in Spanish) of the complex, over a ten-year term, expiring in January 2007. This commitment does not include the remediation of the environmental liabilities arising under previous administrations.

The PAMA considered the implementation of nine projects, aimed at reaching the maximum permissible limits (LMPs as per their initials in Spanish) for solid, liquid and gas emissions. The scope of these projects, along with their investments and technologies, were analyzed by DRP with the support of international consultants, resulting in the need for greater investments to execute the projects, increasing the amount of the initial committed investment from US\$ 107.58 million to US\$ 173.95 million, which led to three PAMA revisions, approved in due course by the Ministry of Energy and Mining (MEM).

During 1998 – 2004, the officially accumulated PAMA investments amounted to US\$ 53.14 million, whereby the originally assumed commitment was US\$ 52.75 for the same period.

By the end of 2006, DRP completed 8 of the 9 projects undertaken in the PAMA, with the exception of the “Sulfuric Acid Plants” project, which, due to technical-economic and financial reasons, originating from the unfavorable metallurgical market conditions during 2002-2003, shall be completed with the start-up of three sulfuric acid plants, progressively, in 2006, 2008 and 2010.

In light of the aforementioned, under Supreme Decree No. 046-2004-EM, DRP submits its request for the “Exceptional Extension of the Deadline to Complete” the PAMA sulfuric acid plants project, in compliance with all requirements and demands of such Supreme Decree (SD).

The 1998 – 2010 environmental commitment requires a total PAMA investment of



US\$ 195.86 million.

## 1.2 COMPLETED AND ONGOING PAMA PROJECTS

### Completed PAMA Projects

During the 1998 – 2004 period, the following PAMA projects were completed:

1. **Mother liquor treatment plant of the Copper Refinery** with a total investment of US\$ 3.09 million.
2. **Handling of slag** with a total investment of US\$ 9.71 million.
3. **Environmental adaptation of Huanchán slag deposit** with a total investment of US\$ 1.07 million.
4. **Arsenic trioxide deposit of Vado** with a total investment of US\$ 2.42 million.
5. **Conditioning of Huanchán ferrites deposit** with a total investment of US\$ 2.10 million.
6. **Sanitary landfill – Cochabamba** with a total investment of US\$ 2.64 million.
7. **Monitoring station/aerial photography** with a total investment of US\$ 0.63 million.

For the PAMA wastewater/waste project, the subproject indicated in item 6 referring to waste has been completed.

### Achievements

The diverse environmental projects completed and set into operation by DRP have led to significant reductions in environmental impacts, including:

As a result of the project for the slag handling system, we solved the problem of the drainage, storage and transportation of copper and lead slag. The drainage of waters from slag granulation waters into the Mantaro river was reduced by 7,000 GPM through its recirculation. A new slag conveyance system was also installed with a capacity of 80 MT/hour, exceeding by more than 25% the volume of slag produced in the copper and lead smelting process.

There is an environmentally safe deposit for the disposal of arsenic trioxide, residue originating from the Copper Circuit, with a double waterproofing layer that eliminates any possibility of contamination of the Mantaro river. This project was executed under the EPA standards (Environmental Protection Agency, USA), in the area of Vado.

A waterproof deposit was constructed for the disposal of ferrites, residue originating from the Zinc Circuit, eliminating by 100% the generation of effluents to the Mantaro river in the Huanchán area.

A sanitary landfill in the Cochabamba area was built and set into operation for the disposal of domestic solid waste produced by the housing facilities of DRP, after a prior reconditioning and remediation of the former disposal area. This project includes disposal and abandonment systems, designed under Canadian standards and has a system for monitoring ground-water quality.

The mother liquor treatment plant of the Copper Refinery (Bleed Off) has eliminated by 100 % the discharge of ferrous acid effluents into the Yauli river, reducing to 0 the 60,000 liters/day previously discharged into the river. The environmental objective of the project was achieved in December 2003.

### **Ongoing PAMA projects**

The following PAMA projects are currently under execution:

1. The industrial liquid effluents treatment plant project, where construction was completed for systems to collect process water, cooling water, rainwater, and wastewater. At the same time, civil works have been conducted to optimize the use of water in metallurgical operations and the recirculation of cooling water. These projects have reduced the volume of effluents flowing into the Mantaro river from 49 m<sup>3</sup>/min to 12.5 m<sup>3</sup>/min, in addition to reducing the number of emission points from 34 to 4. By the end of 2006, with the operation of the treatment plant, the impact of industrial waters from the metallurgical complex on the Mantaro river will have been eliminated.
2. The subproject for the treatment of wastewater produced by the housing facilities of DRP, where three modular treatment plants are being constructed with bio-disc technology. These plants shall be sequentially put into operation in 2006.
3. The sulfuric acid plants project, the reason for the present extension request, involving the operation of three acid plants: the repowering of the existing plants in the Zinc Circuit and the construction of two new plants, one for the Lead Circuit and the other for the Copper Circuit, which shall be operating in 2006, 2008 and 2010, respectively, solving the problem of SO<sub>2</sub> emissions by 17 %, 45 %, and 100% during said years.

To date, for the conditioning of gases in the acid plant, works have been conducted on the electrostatic precipitator of Central Cottrell, which has led to a 23% reduction in the emission of particulate matter emissions originating from the main chimney. This achievement, together with the discontinuation of the New Jersey zinc roasters, amount to a total reduction of 35%, reaching the LMPs for particulate matter emitted by chimneys (100 mg/m<sup>3</sup>). This reduction has been directly related to the reduction of lead and arsenic emissions.

To improve the control of fugitive emissions, which are also directly related to the air quality of areas adjacent to the smelting complex, as corroborated by the health risk study, a project was executed for the drainage of metallurgical dust entailing the installation of the short rotary furnaces # 1 and # 2.

The operation of these furnaces permits the drainage of 1,200 MT of dust per month. Furnace # 1 has been in operation since June 2004, and # 2 is currently in the adjustment stage of operative parameters.

Another project for the control of fugitive emissions is the enclosure of the lead furnaces and foaming plant buildings, which are currently undergoing start-up tests. We expect to obtain a reduction of 215 kg of lead per day in fugitive emissions with this project.

Additionally, various projects are under execution destined to reduce chimney and fugitive emissions, through systems that capture particulate matter in various sectors of the smelting complex, which shall be completed in 2006, and are coherent with the suggestions and recommendations formulated by the health risk study. These systems shall improve air quality by reducing lead, arsenic and cadmium concentrates.

In addition, for the collection of sedimentary dust, both in the city of La Oroya, as well as the industrial zone, two industrial street sweepers are currently in operation.

### **1.3 ACTIONS TO CONTROL BLOOD LEAD LEVELS OF POPULATION NOT EXPOSED THROUGH WORKING [IN THE COMPLEX]**

Between 2000 and 2001, DRP conducted a study of blood lead levels of La Oroya's population, the results of which have given way to the implementation and execution of mitigation actions and control alternatives for this problem. In July 2003, DRP signed an agreement with the Ministry of Health (MINSA as per its initials in Spanish), represented by DIGESA, to conduct actions that would aid to reduce blood lead levels, especially in children under six year of age, an agreement also entered into by the Ministry of Education and the Municipality of La Oroya.

During March of the present year, street and house cleaning programs were initiated, as well as hygiene programs for pregnant women, and training programs on these issues directed toward teachers, mothers and children. Furthermore, children have received medical consultations in the areas of pediatrics and psychology.

Currently, DRP has an individualized treatment program for 56 children in Casaracra, located 10 Km. from La Oroya, where food, early development stimulation, personal hygiene, and medical treatment in general are provided.

In the II Blood Census, initiated in October 2005, other localities have been included, such as Tallapuquio, Norman King, Huari and Paccha. These works are conducted in coordination with the respective authorities.

#### **1.4 SUPREME DECREE NO. 046 -2004 - EM**

The SD No. 046-2004-EM issued by the MEM in December 2004, makes possible the exceptional extension of any project contained in the PAMA that cannot be completed within the agreed to deadlines for justified reasons, provided that the technical requirements and financial guarantees that ensure the execution of the project object of the request are met. Additionally, a study analyzing the health risks is required to determine the impact this extension could have on the population's health. Under this decree, we are requesting the exceptional extension of the PAMA sulfuric acid plants project until 2010.

The grounds for this request are based on the unfavorable conditions of the metals market from 1999 to 2003 that prevented the company from possessing the financial resources necessary to complete this project by 2006. Improvements in the metals market, and the technical-economic and financial studies conducted with respect to the sulfuric acid plants, in addition to the health risk studies, have allowed us to define an investment level and environmental results that will gradually reach the legal permissible limits concerning emissions and air quality by the end of 2010.

In its due time, DRP shall establish the financial guarantees and trustee fund required by SD No. 046-2004-EM, allowing us to complete the entire PAMA project by 2010.

In accordance with recommendations provided by the health risk analysis study, which indicates that exposure to lead is the health risk for children that most urgently needs to be addressed, we are including in this extension request an outline of projects for the reduction of chimney emissions and fugitive emissions, to control lead exposure, that shall be completed by 2006. Furthermore, mitigation actions shall be reinforced by partially suspending operations when the thermal inversion conditions require it as such.

The total investment for the environmental projects, programmed for 1997-2010, amount to US\$ 195.86 million, exceeding by 82% the amount of US\$ 107.58 million originally committed in the PAMA in 1997.

#### **1.5 HUMAN HEALTH RISK STUDY**

In order to conduct this study, DRP hired the company Integral Consulting, known to and with the opinion of the Ministry of Energy and Mining and the Ministry of

Health. The purpose of the study was to predict the future probability of the effects of environmental impacts on the population's health. Integral Consulting, with regards to these predictions, conducted diverse fieldwork in La Oroya, involving people from the community and considering current environmental conditions.

The predictions came from the application of models approved by the Environmental Protection Agency (EPA), that included future environmental information from the McVehil-Monnett study, defining the levels of the environmental impact of particulate matter, lead, arsenic and cadmium by considering the implementation of the new environmental projects.

The risk study confirmed that lead exposure, over other metals, resulting from decades of operation of the complex, constitutes the main health risk factor in La Oroya, and as such its reduction must be prioritized. This study used the results obtained from chemical analyses of samples obtained during fieldwork concerning metals in water intended for human consumption, in soil, in house dust, and in exteriors; of lead, iron, calcium and zinc in food; and of the population's blood lead levels, particularly the children's. Information on the air quality monitoring obtained from DRP's stations was also taken into consideration.

The study recommended to give priority to the reduction of fugitive emissions and to continue with the suspension or cessation of certain operations, during the morning hours, in order to mitigate the impact of SO<sub>2</sub> on the population during periods of thermal inversion, in addition to other actions destined to reduce the population's exposure.

## **1.6 CIVIC PARTICIPATION**

In order to inform the population on the progress of the projects and the reasons for the request for an extension of the deadline for the PAMA sulfuric acid plants project, DRP set up a communications office in La Oroya and another in Huancayo; to date these offices have received 14,890 visitors from the communities.

Together with faculty members of the Universidad Nacional del Centro del Perú, a training program was conducted in sampling techniques and the interpretation of study findings, directed at various representatives of the communities so that they may directly participate in the monitoring processes.

Pursuant to the requirements established by the extension request, four information workshops and three public hearings have been held, with the assistance of 19,700 members of the communities. The information workshops were conducted in La Oroya, Huari, Paccha and Santa Rosa de Sacco, while the public hearings were held in La Oroya, Paccha and Huancayo.

## 1.7 EXTENSION PROPOSAL

The original PAMA considered the execution of nine environmental projects with an execution deadline to expire on January 7, 2007. Eight of these projects shall conclude within the originally established deadline, excluding the sulfuric acid plants project, reason for which we hereby request, under SD No. 046-2004-EM dated December 29, 2004 and within the legal and regulatory framework determined by such decree, the exceptional extension of the project in question.

Technical studies have determined the need to operate with three sulfuric acid plants instead of the two plants originally proposed, with the following nominal capacities:

1. Existing sulfuric acid plant with a capacity of 60,000 MT/year of the Zin Circuit
2. A new sulfuric acid plant with a capacity of 115,000 MT/year for smelting lead.
3. New sulfuric acid plant with a capacity of 200,000 MT/year for the smelting of copper.

In the case of the existing sulfuric acid plant, its repowering shall conclude by the end of 2006, and the new sulfuric acid plants for the smelting of lead and for the smelting of copper shall be implemented by the end of 2008 and 2010, respectively.

The sulfuric acid plant of the Copper Circuit shall require technological changes in the production process to obtain adequate concentrations of SO<sub>2</sub> in the gases emitted, so that the production of sulfuric acid is viable.

The proposal includes projects related to the recommendations set forth in the health risk study, for the reduction of chimney emissions, as well as the reduction of fugitive emissions, in order to reduce lead levels and reach the air quality LMPs.

The sum of investments for the execution of the PAMA, including the extension, amount to US\$ 195.86 million, greatly exceeding the amount of US\$ 107.58 million considered in the original PAMA, ensuring that we may reach the environmental levels required by law. In table 1.6/1 we present a summary of the consolidated PAMA for the 1998 – 2010 period.

**Table 1.6/1**  
**Summary of consolidated PAMA 1998 – 2010 period**  
**(US\$ millions)**

No.	PROJECT	1998-2004	2005	2006	2007	2008	2009	2010	TOTAL
9	Monitoring station and aerial photography	0.6							0.6
4	Handling of Copper and Lead Slag	9.7							9.7
5	Remediation of Huanchán slag deposit	1.1							1.1
6	Handling of Trioxide - Vado	2.4							2.4
7	Conditioning of Huanchán ferrites deposit	2.1							2.1
2	Mother liquor treatment – Copper refinery	3.1							3.1
8B	Household waste - Cochabamba	2.6							2.6
3	Industrial Waters Treatment Plant	17.0	8.3	8.6					33.9
8A	Wastewater	1.6	4.5	2.2					8.3
1	Sulfuric acid plants	13.0	1.4	5.0	25.0	25.0	25.0	24.0	118.4
10	Reduction of chimney dust emissions		0.2	2.4					2.6
11	Reduction of fugitive emissions		3.0	5.8					8.8
12	Complementary Projects		0.8	1.6					2.4
<b>TOTAL</b>		<b>53.1</b>	<b>18.2</b>	<b>25.5</b>	<b>25.0</b>	<b>25.0</b>	<b>25.0</b>	<b>24.0</b>	<b>195.9</b>

## **1.8 SOCIO-ECONOMIC IMPACT**

DRP is presenting this extension request based on a study duly supported from a technical-economic standpoint and fully aware of its responsibility as the principal promoter of economic activity in the region.

The 3,152 workers employed by DRP imply a direct economic dependence of more than 21,600 people, and are responsible for 70% of the business activities in the city of La Oroya emanating from the payment of salaries, amounting to approximately US\$ 50 million on a yearly basis. In light of the fact that the majority of the workers of La Oroya reside in the central region of Peru, the socio-economic impact the metallurgical complex of La Oroya is of great significance.

Moreover, DRP maintains direct business relations with various companies within the region, mainly with providers of concentrates, electric energy, transportation services and others, in an amount exceeding US\$ 390 million a year, making DRP the most important source of indirect job creation.

DRP, as part of its social responsibility program, has been working with the surrounding communities to promote their sustainable development, with a budget of US\$ 0.70 million a year, facilitating the development of activities in the fields of youth work training, educational infrastructure, improvements in livestock wellbeing, pastures, forestry and Andean landscaping, as well as conducting health campaigns, creation of new business and environmental education.

## **1.9 FINANCIAL STATEMENTS**

Economic analyses made prior to the acquisition of La Oroya, estimated the EBITDA and net profits as greater than those obtained in the past five years, excluding 1998, as a consequence of the deterioration of market conditions with respect to metal prices and a reduction of production output.

This situation caused an accumulated loss of US\$ 88.78 million, with a significant decrease of Cash Flow available to cover investments greater than those originally stipulated in the PAMA that would have permitted the execution of the sulfuric acid plants in 2006. This can be observed in the financial statements of the past five years, included in Annex VI.

The proposal of this present document is based on new operative projects that would generate EBITDA that, added to the improvement of current conditions in the metals market, translate into a greater price of production output, allowing for the development of a business plan that would cover investment needs required for the 2004 – 2010 period.



## **1.10 FINANCIAL GUARANTEE AND TRUST FUND AGREEMENT**

The S.D. No. 046-2004-EM provides for the granting of a financial assurance, in favor of the Ministry of Energy and Mining, in the form of a bank letter of guarantee, jointly, unconditional, irrevocable, and executed automatically, with a value of 20% of the price for executing the extended project.

Therefore, DRP shall proceed to obtain the financial guarantee through a local banking entity in the form of the respective letter of guarantee, thirty days after the extension request has been approved.

The company, based on results obtained through October 31, 2005 and prospects made for 2006, considers it shall be able to obtain sufficient available cash to obtain the line of credit from the bank issuing the letter of guarantee.

According to that provided in SD No. 046-2004 –EM, a draft was produced of the agreement TRUST FUND UNDER ADMINISTRATION between DOE RUN PERU S.R.L. as TRUSTOR and BANCO WIESE SUDAMERIS acting as TRUSTEE, and the MINISTRY OF ENERGY AND MINING through the DIRECTORATE-GENERAL OF MINING, acting as BENEFICIARY.

The purpose of the agreement is the constitution of a TRUST FUND UNDER ADMINISTRATION, irrevocable and unconditional, under which the TRUSTOR, pursuant to that provided in articles 274 and other pertinent articles of the LAW, transfers through the trust future cash flows to the TRUSTEE so that the latter may incorporate them into the TRUST PROPERTY, and earmark them to fulfill investment commitments approved by the Ministry of Energy and Mining for the modified PAMA.

## 2 PRESENT PAMA COMMITMENT

### 2.1 GENERAL CHARACTERISTICS

The metallurgical complex of La Oroya, under the administration of Centromín Perú S. A. (CMP), according to national legislation, produced its PAMA in 1996 so that it would have at its disposal an environmental program that would allow it to, within a ten-year period, reach the LMPs with respect to the handling of solid residue, liquid effluents and gas emissions.

This PAMA, approved by RD 334-97-EMDGM on October 16, 1997 for US\$ 131.74 million, during the period of privatization of the metallurgical complex, was divided into two parts: First, it took into account environmental liabilities under CMP's responsibility, for US\$ 24.17 million, and second, for US\$ 107.58 million, to be assumed by the future owner.

DRP, when it took over operations at La Oroya on October 24, 1997, assumed the PAMA of the metallurgical complex for a total of US\$ 107.58 million. The development of engineering studies involved in the PAMA reflected the need for increasing the initial investment of such projects in order to reach the LMPs. These increases were presented to the MEM and approved on three occasions; the final approval was granted on January 25, 2002 in the amount of US\$ 173.95 million.

The implementation strategy for the PAMA projects, created by CMP and taken over by DRP, was to first execute those projects aimed at resolving the impacts produced by solid and liquid emissions, while concurrently conduct studies aimed at assessing alternatives for improving the concentration of SO<sub>2</sub> in process gases, and finally design and install sulfuric acid plants.

Within this scheme until the latter part of 2004, DRP, with an invested amount of US\$ 53.14 million, completed 6 of the 9 projects included in the PAMA, in addition to the sanitary landfill subproject, leaving the projects for the treatment of industrial waters, wastewater and sulfuric acid plants under execution. The first two of such projects shall be put into operation by the end of 2006.

Given that the deadline of the current PAMA is January 7, 2007, DRP faces the need to request the exceptional extension of the deadline to fulfill the compliance term in accordance with SD No. 046-2004-EM, solely for the sulfuric acid plants, comprised of the operation of three sulfuric acid plants: the plant currently in operation shall be repowered by the end of 2006, and two new plants, one for the smelting of lead and the other for copper, shall be operating, sequentially, by 2008 and 2010, respectively.

## 2.2 COMPLETED PAMA PROJECTS

Of the US\$ 53.14 millions invested since December 2004, US\$ 21.66 million correspond to projects completed during the 1997 – 2004 period, shown in Table 2.2/1, and currently operational.

**Table 2.2/1**  
**INVESTMENTS IN COMPLETED PAMA PROJECTS**  
**IN US\$ THOUSANDS**

DESCRIPTION	1998	1999	2000	2001	2002	2003	2004	TOTAL 1998- 2004
COPPER REFINERY MOTHER LIQUOR TREATMENT PLANT	1,342	20		242	381	511	589	3,085
HANDLING OF SLAG	813	1,975	5,990	930				9,708
ENVIRONMENTAL ADAPTATION OF HUANCHÁN SLAG DEPOSIT	230			266	201	358	36	1,091
ARSENIC TRIOXIDE DEPOSIT - VADO	115	300	1,369	627	8			2,420
CONDITIONING OF HUANCHÁN FERRITES DEPOSIT				254	1,249	228	373	2,104
WASTE – (Cochabamba Sanitary landfill)	250	36	73	424	786	554	504	2,627
MONITORING STATION/AERIAL PHOTOGRAPHY	328	234	65					628
	<b>3,079</b>	<b>2,565</b>	<b>7,497</b>	<b>2,743</b>	<b>2,625</b>	<b>1,651</b>	<b>1,502</b>	<b>21,662</b>

### 2.2.1 SUMMARY OF COMPLETED PAMA PROJECTS

#### COPPER REFINERY MOTHER LIQUOR TREATMENT PLANT

##### Objective

Eliminate ferrous-acid solution discharges into the Yauli river by treating the bleed off solution from the Copper Refinery.

##### Description

This project consisted of the oxidation/neutralization of drained solution to eliminate arsenate and antimonite impurities, followed by a copper sulfate crystallization stage. Part of the mother liquor produced from this process is recirculated back to the Copper Refinery.

The remaining mother liquor is treated through a cementing process with scrap iron to recover the copper and the ferrous acid solution is sent to the Cadmium Plant # 2 to promote the generation of iron arsenates. Chart 2.2.1/1.

##### Current situation

With the treatment of 100% of the drained solution, the bleed off, discharge into the Yauli river has been eliminated by the control point R-2.

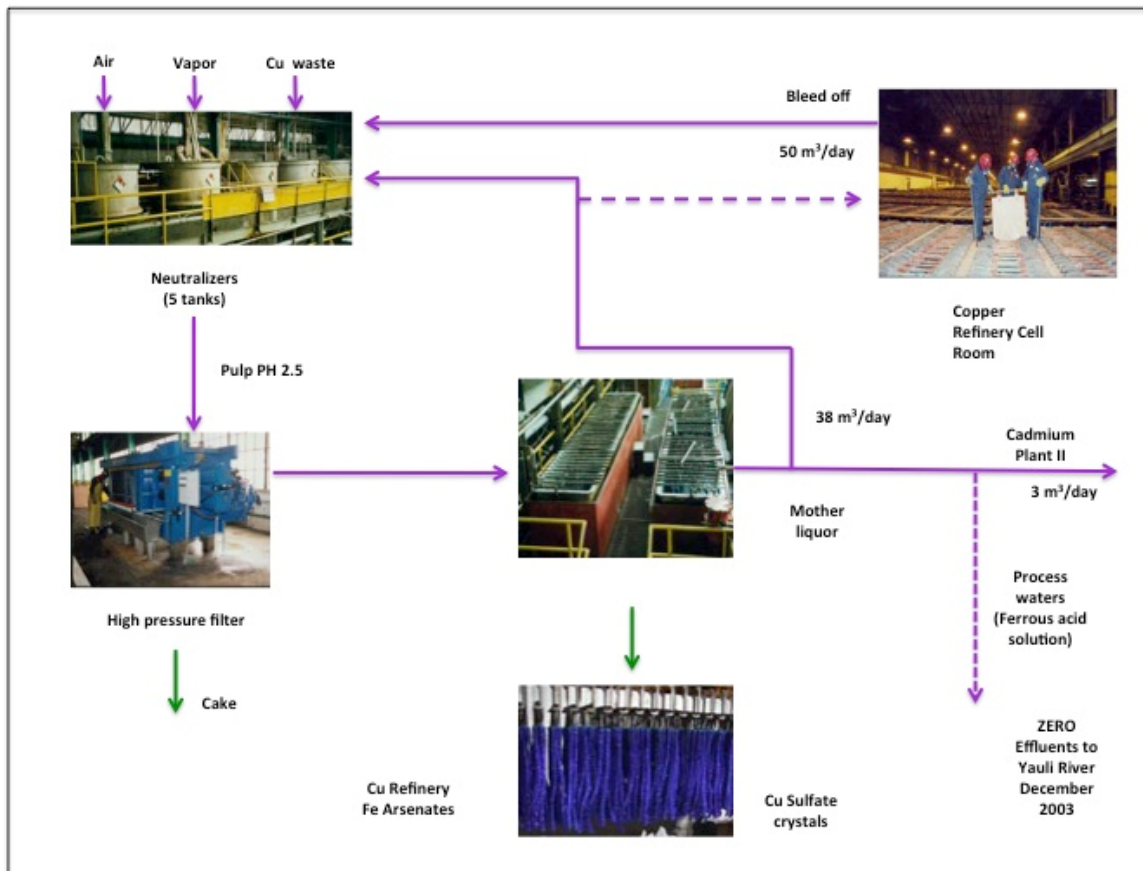
## Environmental Impact

The installation and start-up of the project has led to the complete elimination of the discharge of ferrous acid effluents into the Yauli river, since December 2003.

**Investment:** US\$ 3,090,000

**Chart 2.2.1/1**

### FLOW CHART OF THE COPPER REFINERY MOTHER LIQUOR TREATMENT PLANT



## SLAG HANDLING

### Objective

To implement a new copper and lead slag handling system and eliminate liquid and solid discharge into the Mantaro river.

### Description

The project involved the implementation of a solid-liquid separation system using a

spiral sorter, a Lamella clarifier, a new cable-borne transportation system, and a new slag distribution conveyance system, in the area of Huanchán.

### **Current Situation**

The project became operative in January 2001.

### **Environmental impact**

With this project, the volume of water used for slag granulation has been reduced by 88% (from 8,000 gal/min to 1,000 gal/min) due to the recycling of 4,860 gal/min, preventing discharge into the Mantaro river. Additionally, 100% of the slag produced is transported to the Huanchán industrial deposits.

**Executed investment:** US\$ 9,710,000

## **ENVIRONMENTAL ADAPTATION OF HUANCHÁN SLAG DEPOSIT**

### **Objective**

Eliminate the dispersion of fine slag particles due to wind and sediment cause by rain towards the Mantaro river. This adaptation project has made it possible to improve the area's landscape.

### **Description**

The project involved the stabilization of slopes adjacent to the Main Road, the construction of runoff channels, the waterproofing of 17,000 m<sup>2</sup> followed by forestry works and the planting of a row of trees at the foot of the slope adjacent to the road.

### **Current situation**

The installation of geo-synthetics (geomembranes, geogrids and ecological bags) was finalized, the afforestation of a 17,000 m<sup>2</sup> area with herbaceous species was completed, and, additionally, perimeter rainwater collection channels, walls and drains were constructed to prevent slag from draining into the Mantaro river.

The project was completed in May 2004.

### **Impact of the project**

To guarantee the physical stability of slag deposits and improve the visual appearance of the area.

**Executed investment:** US\$ 1,090,000

## **ARSENIC TRIOXIDE HANDLING**

### **Objective**

To implement a system for the handling, transportation and final disposal of arsenic trioxide under the U.S. EPA standards.

### **Description**

The project consists of the construction, in the area known as VADO (located 9 km. from La Oroya), of two wells with a double waterproofing layer; a main well for the disposal of arsenic trioxide and another for the handling of liquids.

It is worth mentioning that this project, with a zero discharge philosophy, considers the reuse of leachate for forming the pulp to be discharged into the storage facility and has a safety system for arsenic trioxide handling within the plant.

### **Current situation**

The project went into operation in February 2001.

### **Environmental impact**

The waterproofing system and recirculation of rainwater eliminates the discharge of effluents into the Mantaro river, and the manner in which it is disposed of in pulp form with cement and lime eliminates the dispersion of particulate matter into the environment.

**Executed investment:** US\$ 2,420,000

## **CONDITIONING OF HUANCHÁN FERRITE DEPOSIT**

### **Objective**

The construction of a storage facility allowing the elimination of the environmental impacts caused by the disposal of zinc ferrites in the Huanchán area.

### **Description**

The project consisted of lifting and compacting the peripheral wall in the more stable part of the old well No. 4, waterproofing 70,000 m<sup>2</sup> with geoproducts (geomembranes and geotextiles), and the installation of a system for collecting and handling rainwater. It also involved the repair and construction of drainage channels for managing surface runoff and ensure the stability of the deposit.

### **Current situation**

The project became operative in November 2002.

## **Environmental impact**

The system permits the temporary storage of residue produced in the zinc refinery under environmentally safe conditions, with no impact whatsoever on the Mantaro river, ensuring the operative continuity of the Zinc Circuit.

**Executed Investment:** US\$ 2,100,000

## **DOMESTIC SOLID RESIDUE STORAGE FACILITY**

### **Objective**

The creation of a sanitary landfill for the proper disposal of domestic solid residue produced in DRP's housing facilities in La Oroya.

### **Description**

The project consists of the construction of a sanitary landfill for the disposal of domestic solid residue originating from DRP's housing facilities, in the Cochabamba area, located 9.5 Km. to the SE of the city of La Oroya. This sanitary landfill includes control and monitoring systems to ensure compliance with current environmental regulations.

### **Current situation**

To date, the project is fully operative.

### **Impacts of the project**

The project prevents soil, air and water contamination in the area where the domestic solid residue is disposed of.

The project has permitted the cleaning and recovery of 22 hectares previously affected by the improper disposal of residue in the past.

It prevents the proliferation of rodents and insects in the area.

**Executed investment:** US\$ 2,630,000

## **MONITORING STATION / AERIAL PHOTOGRAPHY**

### **Monitoring**

#### **Objective:**

Define the baseline and control of air quality, through reliable measurements of

PM<sub>10</sub> and SO<sub>2</sub> particulate matter.

### **Description**

The project consists of the installation of 5 air-quality monitoring stations and one meteorological station. These stations are located, in accordance with the results obtained from studies applying dispersion models, in: Sindicato de los Obreros, Hotel Inca, Huanchán, Cushurupampa and Casaracra, and cover a radius of 10 km. from the main chimney. The meteorological station was installed in the smelter area.

### **Aerial photography**

#### **Objective**

The creation of a tool to define environmental project execution strategies by obtaining information relating to topography, access routes, land use, available areas and populated influence areas.

#### **Description**

The study of the complex areas and its zone of influence was conducted with the photographic and aerial topographic survey in an extended area of 560 km<sup>2</sup> (20 km. x 28 km.).

#### **Current situation**

The project is fully operational since October 1999.

#### **Impacts of the project**

Obtain meteorological data with real-time information and possess a visual monitoring system of gases for controlling mitigation programs and programs alerting of the need to interrupt the plant's operation.

**Executed investment:** US\$ 630,000

## **2.2.2 ACHIEVEMENTS**

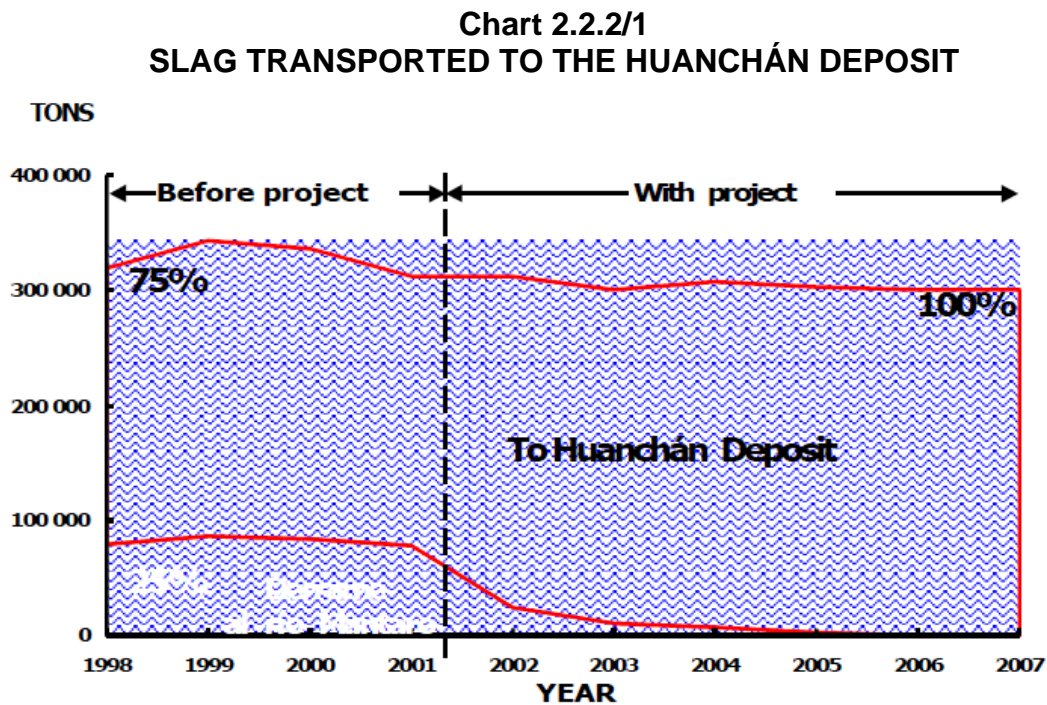
The various environmental projects conducted by DRP have resulted in significant reductions in the environmental impacts registered at the time ownership of the metallurgical complex was transferred.

The main results achieved are:



## SOLIDS

- The problems involving the drainage, storage and transportation of copper and lead slag were resolved with the Handling and Disposal of Slag project, making possible the transportation of 100% of all slag produced in the Copper and Lead Circuits to the Huanchán storage site, as shown in the following chart.

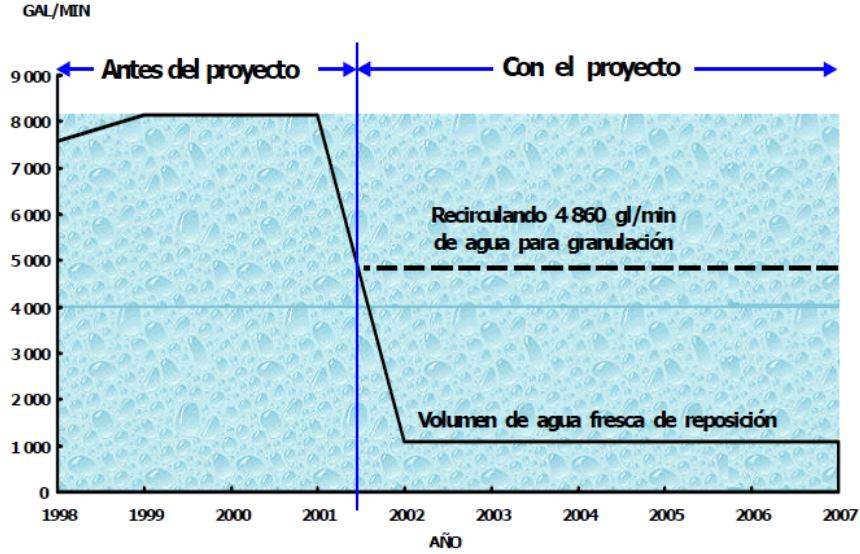


- The handling, transportation and environmentally safe disposal of 100% of all arsenic trioxide produced in the Copper Circuit.
- The handling, transportation and environmentally safe disposal of zinc ferrites (leaching residue) produced in the Zinc Circuit. This project has eliminated 100% of all effluents discharged into the Mantaro river.
- The proper handling of domestic solid residue originating from DRP's housing facilities and resolving the historical problem of waste in the Cochabamba area.

## LIQUIDS

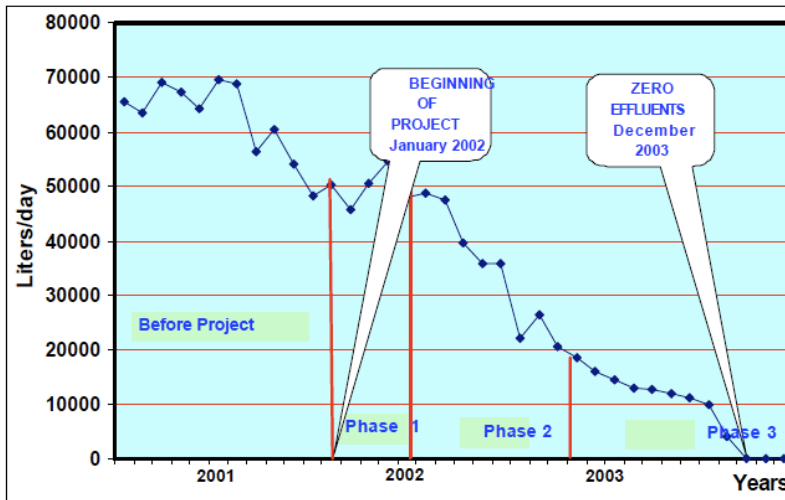
- The discharge of waters used for slag granulation, originating from the copper and lead smelters, into the Mantaro river has reduced by 95% owed to the implementation of the Slag Handling and Disposal project, the same project that has led to the recirculation of 4,860 gal/min of water used for granulation.

**Chart 2.2.2/2**  
**REDUCTION OF WATERS USED IN SLAG GRANULATION**



- The Copper Refinery Mother Liquor (bleed off) treatment project has eliminated 100% of ferrous acid effluents previously discharged into the Yauli river. This project has met its environmental objectives since December 2003.

**Chart 2.2.2/3**  
**ELIMINATION OF FERROUS ACID SOLUTION DISCHARGE INTO THE YAULI RIVER**



## 2.3 PAMA PROJECTS CURRENTLY UNDER EXECUTION

Concurrently with other completed projects, DRP has been developing activities in other committed PAMA projects, of which, concerning those involving liquid effluents that were to be completed by 2006, only the one project, object of this extension request, is pending: the sulfuric acid plants.

Total investments made through December 2004 in projects currently under execution are as follows:

**Table 2.3/1**  
**INVESTMENTS MADE IN PROJECTS UNDER EXECUTION**  
**In US\$ thousands**

DESCRIPTION	1998	1999	2000	2001	2002	2003	2004	TOTAL 1998- 2004
SULFURIC ACID PLANT	161	248	503	426	2,696	4,010	4,910	12,953
INDUSTRIAL LIQUID EFFLUENTS	653	2,541	2,783	1,941	2,619	1,544	4,888	16,969
WASTEWATER		8	47	36	50	38	1,375	1,555
	814	2,796	3,333	2,404	5,365	5,591	11,173	31,477

### 2.3.1 SUMMARY OF PAMA PROJECTS UNDER EXECUTION

#### INDUSTRIAL WATERS TREATMENT PLANT

Four types of liquid effluents have been identified in the metallurgical complex: process water, cooling water, wastewater and rainwater, all of which must be treated to adjust their contents in accordance with environmental legislation, before they are discharged into the Mantaro river.

#### Objective

In order to keep discharges into the Mantaro river within the maximum permissible limits, an industrial liquid effluent treatment plant shall be constructed. The recirculation of cooling waters shall complement the project.

#### Description

The project for the integral treatment of industrial liquid effluents considers three phases:

Phase I: **Collection system**, installation of pipelines to collect the waters according to their specifications.

Phase II: **Homogenization**, separation and/or mixture of liquid effluents according to their specifications, for uniform pumping into the treatment plant.

Phase III: **Treatment plant**, final stage of the water treatment through the use of additives that permit to achieve class III water quality, meeting the LMPs.

Additionally, auxiliary projects such as the tire washer circuit and truck hoppers for transporting concentrates (already completed), and vehicles that circulate within the industrial zone, optimizing the water used for the granulation of copper and lead slag, permitting a reduction in water volume and the content of solids to be pumped into the treatment plant, have been considered.

### **Current situation**

The construction of a collection system has concluded, which includes the main and secondary collector, located inside the plants. To that end, more than 15 km. of HDPE piping has been installed, with diameters ranging between 8 and 48 inches.

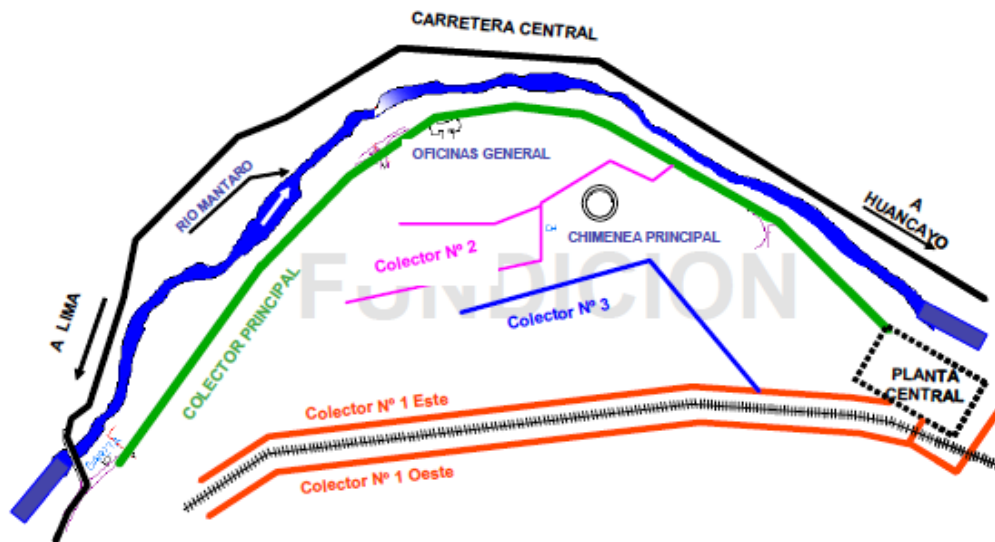
A coated runoff channel has been constructed for rainwater collection in the Cerro Sumi (Sumi Hill), in the upper part of the smelter, to collect runoff water and prevent it from flowing into the industrial area.

Equalization tanks are currently undergoing construction, which will enable the homogenization of collected waters before they are processed in the treatment plant.

We possess the detail engineering of the industrial waters treatment plant and construction shall commence in January 2006. The equipment for the plants is presently being acquired, in accordance with the specifications provided by the engineering studies. The plant shall integrally enter into operation by the end of 2006.

Chart 2.3.1/1 shows the general arrangement of the industrial waters collection systems.

**Chart 2.3.1/1  
GENERAL ARRANGEMENT OF THE INDUSTRIAL WATERS COLLECTION SYSTEMS**



**Environmental impact**

The purpose of this project is to eliminate the discharge of industrial liquid effluents that do not meet the permissible limits (Class III water). The project is estimated to treat 7.27 m<sup>3</sup>/min. of process waters.

The treated waters, for the most part, shall be recirculated, and water released into the water body shall fall within the LMPs.

**Investment executed to date:** US\$ 22,950,000 (October 2005).

**Total projected investment:** US\$ 33,870,000.

**Schedule of activities:** The industrial waters treatment plant shall be completed by the end of 2006. A Gantt chart detailing the project's main activities, in addition to representative engineering blueprints, are included in Annex I A.

**WASTEWATER TREATMENT PLANT**

The sewage system currently in place for DRP's housing facilities are comprised of a network that collects wastewater and slag discharged into the water bodies without prior treatment.

Currently, there are 10,000 persons residing in the housing and hotel areas under DRP's administration, generating a flow of 45 liters per second (lps) that are discharged, without prior treatment, into the Mantaro and Yauli rivers.

## **Objective**

The purpose of this project is to treat wastewater originating from DRP's housing facilities and the industrial zone and adjust its discharge in accordance with the LMPs, established by current legislation.

## **Description**

Given the disperse location of DRP's residential areas and the area's topography, engineering studies have defined the requirement to build three modular treatment plants: one located in the Huaymanta zone with a treatment capacity of 35 lps, for wastewater generated in Marcavalle, Sindicato SEYO, Huaymanta Refinery, and the camps Buenos Aires, Santa Rosa, Esmeralda, and Huampaní; another, with a treatment capacity 4.5 lps, for wastewater generated in Chulec, Mayupampa and other residential areas; and finally one plant located in the extreme south end of the Smelter, with a treatment capacity of 8.0 lps, for wastewater generated in the residential areas of Hidro, Edificio Sesquicentenario, Hotel Inca, ex Hotel Junín and the metallurgical complex.

## **Applied technology**

The treatment chosen for wastewater is the Combined Biological Treatment System for activated sludge and rotary biological discs, with the final disposal of treated effluents into the Mantaro river or the Yauli river.

In general, the plants shall possess the following components:

- A chamber with gates, with (01) automatically activated gate, a solids compactor, and (01) manually activated gate
- Pretreatment and equalization tank, with submerged radial aeration
- Elevation station from the river tributary to the aeration tank
- Flow regulator
- Aeration tank, with mechanical aerators and activated sludge
- Sedimentation tanks
- Chlorination contact chamber, for disinfecting with sodium hypochlorite
- Sludge pumping station
- Sludge digester with a submerged radial aeration system
- Dehydration system for sludge with a press filter

## Characteristics of the River Tributary

River flow	PTAR-01 Chulec	PTAR-02 Huaymanta	PTAR-03 Smelter
Average [capacity]	4.23	32.03	7.28
Max. Volume	8.46	64.06	14.56
Min. Volume	2.12	16.02	3.64

Charge of OBD <sub>5</sub>	
mg OBD <sub>5</sub> /l	108

The conditions of the clarified effluent shall be in a monthly average concentration and comply with the required regulation (Class III water, for agricultural use and animal consumption).

### Expected quality of effluents

Parameter	Value
OBD <sub>5</sub>	< 15 mg/l
Suspended solids	< 15 mg/l
Fecal coliforms	< 1000 MPL/100 ml

### Current situation

Prior to the development of detail engineering, the following studies were conducted:

- A conceptual study for the collection and treatment of wastewaters in the region of La Oroya, conducted by SVERDRUP in 1999.
- A conceptual study for Drinkable Water, Sewage, and Waste treatment systems in the areas of Chulec, Chupampa and Mayupampa, conducted by CESEL in 2002.
- A profile of the project “Extension and improvement of the drinking water and sewage system in the city of La Oroya”, conducted by Doe Run Peru in 2003, to define the scope of the PAMA project within the global scheme of the city.
- The measurement of contributing water flows to the sewage system in the areas of Chulec, Chupampa and Mayupampa.

Detailed engineering was developed by the company SETARIP and involved the following stages:

**Collection Systems**, of which the Huaymanta and Chulec plants collection systems have been completed. Construction of the collection system for the smelter is underway.

**Wastewater Treatment Plant.** Three modular plants with bio-disc technology have been acquired, and are currently undergoing installation.

### **Environmental impact**

Prevent discharges of organic matter, suspended solids and microorganisms into the Yauli and Mantaro rivers. The final effluents shall meet the LMPs provided for Class III water.

**Executed Investment:** US\$ 4,920,000 (through October 2005)

**Projected total investment:** US\$ 8,250,000.

**Schedule of activities:** This project should be completed by August 2006 and tested by December 2006. A Gantt chart detailing the project's main activities, in addition to representative engineering blueprints, are included in Annex I B.

### **SULFURIC ACID PLANTS**

The metallurgical complex of La Oroya treats sulfurous concentrates of lead, zinc and copper, and during their pyrometallurgical processing is when the greatest amount of sulfur is emitted as SO<sub>2</sub> through the chimney.

Currently, the Zinc Circuit possesses a plant with 55,000 t/year of nominal capacity for the production of commercial sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) from sulfurous gases of the Lurgi roaster.

Due to the complexity of La Oroya's operations, during the development of CMP's PAMA, services were required of the consulting firm Kilborn SNC - Lavalin Europe to estimate the necessary investments and arrangements for handling the metallurgical dust and subsequent control of SO<sub>2</sub> gas produced in the smelter. Based on such study, CMP defined the Sulfuric Acid Plants project that was included in La Oroya's PAMA.

In 1997, DRP deemed it convenient to develop a short-, medium-, and long-term action plan for which it hired the services of the company BHA, who assessed the gas and particulate matter management systems of the smelter's different plants. As a result of the study, various tasks to be performed in the smelter were defined, the most immediate of which was the instrumentation, control and modernization of "Central Cottrell", a plant for the cleaning of gases and the recapturing of dust.

Among the medium-term measures to be taken were improvements to the systems for the capture and transportation of gases and particulate matter, prioritizing the maintenance of the main pipelines and improvements in the design of the connecting points between the pipes and entry into the Central Cottrell plant.



## Objective

To reach the gas emissions LMPs in future operative conditions, it is necessary to contain 79.3% of the sulfur entering the smelter, however, given the complexity of this process, due to the treatment of polymetallic concentrates, gases with different concentrations of SO<sub>2</sub> are produced, requiring an integral study of the processes to be conducted to thus obtain gases with proper SO<sub>2</sub> concentration that allow their conversion into sulfuric acid.

## Description

For the sequential achievement of this project's objectives, the following stages have been considered:

Phase I: **Environmental Mitigation**, including the improvement of the gas cleaning and dust capturing system, known as Central Cottrell, and the installation of short rotary furnaces # 1 and # 2 for treating captured dust in Central Cottrell, preventing its recirculation back to the copper and lead smelting beds.

Phase II: **Conditioning of Gases**. The modification of the gas handling system of the sintering machine, in the Lead Circuit, involves the separation and capture of the greatest amount of SO<sub>2</sub> concentration and guide it to the cooling, cleaning and sulfuric acid production systems. In the case of the Copper Circuit, a technological change is currently being assessed that would include the installation of a new bath fusion reactor, replacing the current oxy-fuel reverberatory furnace, permitting to obtain process gases with a higher SO<sub>2</sub> concentration suitable for the production of sulfuric acid.

Phase III: **New Sulfuric Acid Plant**, entailing the development of the different engineering stages, based on the results of the pre-feasibility study, and includes a Master Plan for the development and execution of the project in start-up mode. Within that context, the acquisition, construction and installation stages shall be executed between 2006 and 2010.

## Current Situation

### Phase I

The efficiency of the electrostatic precipitator at Central Cottrell has been improved with the installation of a new system of plaques and electrodes, automatic voltage controllers with supervision software, PLC analogue communication modules, and structural repair works of the pipelines. The amount invested in this project was US\$ 2,190,000.

The short rotary furnaces #1 and #2 are currently operative. Both furnaces treat dust from Central Cottrell and other recirculating dust. The short rotary furnaces #

1 has been operative since June 2004, and the short rotary furnace #2 since July of this year. Through October 2005, a total of 6,433 MT of material has been processed, preventing their recirculation back to the copper and lead circuits. The total investment for the execution of the project involving both furnaces has been US\$ 8,570,000.

Additionally, an environmental mitigation plan has been put into action, involving the interruption of the plants' operations during periods of thermal inversion so as to minimize the environmental impacts caused by said meteorological phenomenon and the lack of winds.

Finally, beginning January 1<sup>st</sup>, 2005, the operation of the three New Jersey roasters (FBR) of the Zinc Circuit was stopped, with the subsequent reduction of 130 MT/day in SO<sub>2</sub> emissions and 1.1 MT/day in particulate matter emitted through the chimney.

## **Phase II**

The technical feasibility study was completed to optimize/modify the sintering machine, in addition to determining gas flow and concentration, to capture the largest amount of SO<sub>2</sub> concentration for the production of sulfuric acid. The study was conducted by the Canadian consultant Robert Charles Nutten, and demonstrated the technical feasibility of the project. (See Annex II A).

The conceptual engineering for the modernization study was completed for the copper smelter. Its purpose is to project the capture of over 80% of sulfur contained in processed copper concentrates, through the installation of an El Teniente Converter (TC) as a sole smelting unit, replacing the current oxy-fuel reverberatory furnace (See Annex II B), and the integral feasibility engineering study is currently under development by the consortium INDEC-IM2-CODELCO of the copper smelter for the recovery and control of targeted materials, such as copper, silver, gold, and others, (See Annex II C).

## **Phase III**

A technical feasibility study concerning the present sulfuric acid plant has been completed for the Zinc Circuit (See Annex II D) and detail engineering is currently being developed to replace the main equipment with new equipment, such as a new drying tower and its respective pumping tanks, acid pipes and gas pipelines, as well as specifications for the purchase of new acid coolers, to ensure the operational continuity of the current sulfuric acid plant. (See Annex II E).

Additionally, a basic engineering study and a cost estimate is currently underway for a new sulfuric acid plant that will treat the sulfurous gases originating from the lead sintering machine. (See Annex II F).

The conceptual engineering and a capital costs estimate are currently under

development for a new sulfuric acid plant that will treat sulfurous gases originating from the copper smelting processing. (See Annex II G).

These studies are being conducted by the Canadian company Fleck Chemical Industrial Inc.

The investment for this studies phase through October 2005 has been US\$ 660,000, with an advance of 22% on the integral project.

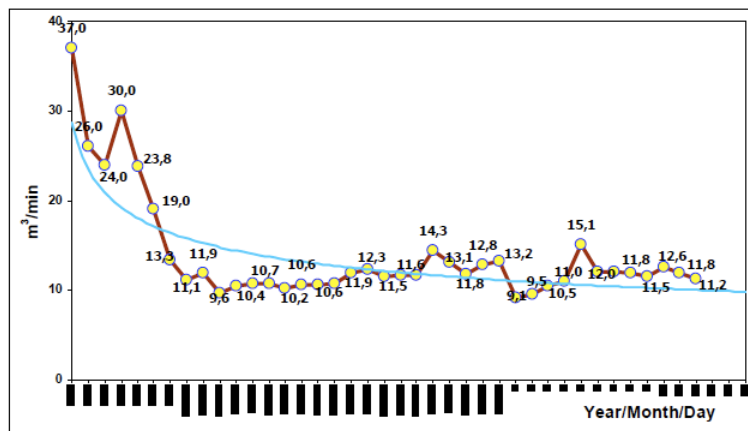
### 2.3.2 ACHIEVEMENTS OF THE PAMA PROJECTS UNDER EXECUTION

The total or partial execution of the projects and subprojects is giving way to important reductions of the environmental impact. Among the principal results are:

#### LIQUIDS

- The optimization of the use of water in different processes, the recirculation of cooling waters and the construction of collection systems for the Industrial Waters Treatment Plant, have led to a decrease in the total volume of liquid emissions by 75% (from 49.6 m<sup>3</sup>/min. to 12.5 m<sup>3</sup>/min.), reducing the number of emission points of effluents into the Mantaro river from 37 to 4. Chart 2.3.2/1.

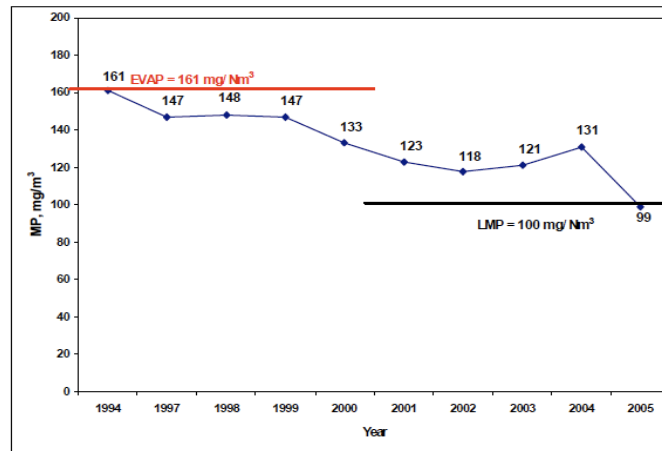
**Chart 2.3.2/1  
REDUCTION IN VOLUME OF LIQUIDS DICHARGED INTO THE MANTARO RIVER**



#### GASES

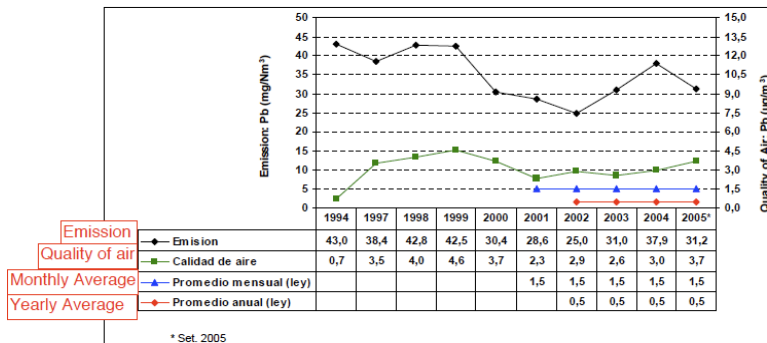
- The modernization and optimization efforts conducted in the Central Cottrell have given way to a reduction in the emission of chimney particulate matter by 23% that, in addition to the reduction produced by the interruption of the operation of the New Jersey zinc roasters, reaches 35%, as shown in Chart 2.3.2/2.

### Chart 2.3.2/2 PARTICULATE MATTER EMISSIONS ORIGINATING FROM THE MAIN CHIMNEY

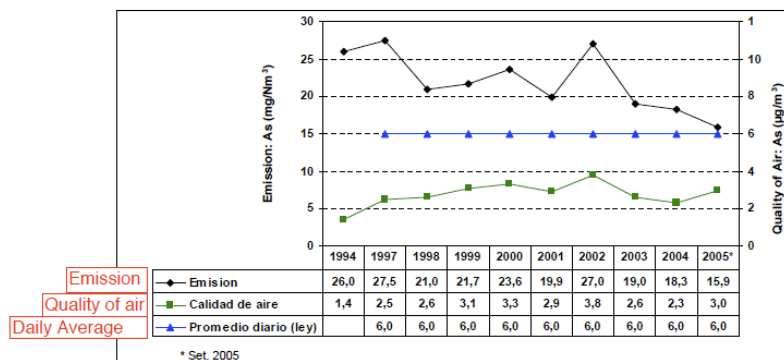


- The reduction of particulate matter emissions had a direct relation with the decrease in lead and arsenic emissions, as shown in Charts 2.3.2/3 and 2.3.2/4.

### Chart 2.3.2/3 LEAD EMISSIONS ORIGINATING FROM THE MAIN CHIMNEY



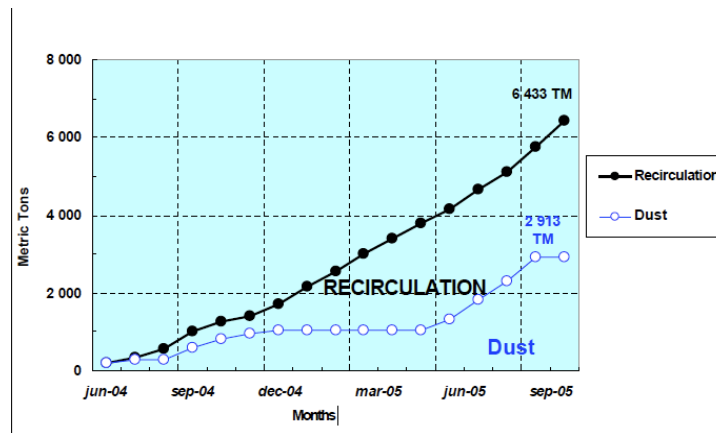
### Chart 2.3.2/4 ARSENIC EMISSIONS ORIGINATING FROM THE MAIN CHIMNEY



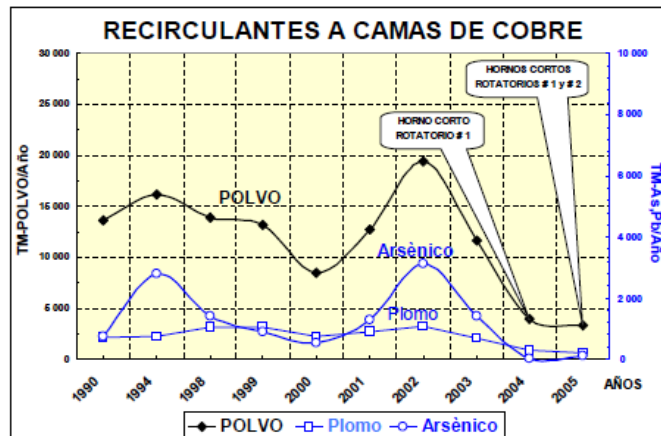
## RECIRCULATION

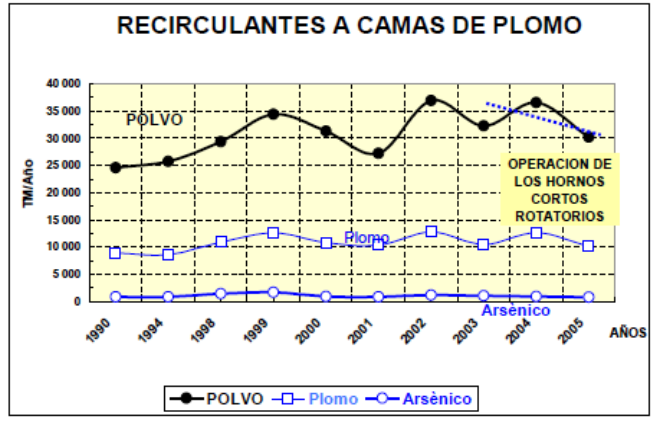
- As a result of the operation of short rotary furnaces for the treatment of dust and other materials, recirculated matter that previously had been returned to the copper and lead circuits through smelting beds has been reduced by 6,433 MT. Of that amount, 2,913 MT correspond to dust recaptured in the Central Cottrell after the cleaning of gases originating from the copper converters, the sintering plant and lead furnaces. In this respect, there is now better control over the fugitive emissions of particulate matter.
- Charts 2.3.2/5 and 2.3.2/6 show the accumulated treatment of materials in the SRFs and the decrease in the amount of dust recirculated back to the copper smelting beds.

**Chart 2.3.2/5**  
**ACCUMULATED RECIRCULATED MATERIAL TREATED IN THE SHORT ROTARY FURNACES.**



**Chart 2.3.2/6**





### 3 REQUEST FOR AN EXCEPTIONAL EXTENSION: SULFURIC ACID PLANTS

#### 3.1 CONSIDERATIONS

The PAMA sulfuric acid plants project, part of the acquired commitment to the government, considers the schedule of expenditures shown in Table 3.1/1; one can observe that the highest amount, US\$ 97,500,000, corresponds to the 2005 – 2006 period.

**Table 3.1/1**  
**SCHEDULE OF YEARLY INVESTMENTS**  
**In US\$ thousands**

PROJECT	1998	1999	2000	2001	2002	2003	2004	2005	2006	TOTAL
Sulfuric acid plants	161		503	400	1,000	3,500	4,500	43,000	54,500	107,564
Annual %	0.15%	0.00%	0.47%	0.37%	0.93%	3.25%	4.18%	39.98%	50.67%	100.00%
Accumulated %	0.15%	0.15%	0.62%	0.99%	1.92%	5.17%	9.36%	49.33%	100.00%	

For technical reasons, stemming from the pre-feasibility studies, the need to perform changes in the operations and processes of the metallurgical complex has been defined in order to obtain gases with adequate concentrations of sulfur dioxide ranging from 6% to 10%, without which the production of sulfuric acid would not be viable. Such changes refer to alterations in the operation and management of gases in the sintering machine of the lead smelter, and changes to the smelting processes and conversion of copper smelting.

As this project must be developed under a start-up operation mode, it technically requires between 3.5 and 4 years for its execution; the implementation of the project is not possible within the two years remaining until the PAMA deadline (2005 and 2006). Additionally, concerning the amount of time required for the engineering development, we must also consider the high complexity involved in the execution of constructions within operating metallurgical installations, as this implies complementary works for freeing-up areas and relocating plants and services (water lines, steam lines, electric energy lines), together with safety considerations due to the high traffic of people and vehicles and equipment of regular operations.

On the other hand, the economic problems of 1993 through 2003, caused by the drop in prices in the international metals market, impeded the availability of resources necessary for the execution of the investments that were programmed at 90.64% for 2005 and 2006, corresponding to this project.

In light of the above, new deadlines are required, adjusted to the technically required amount of time needed for the implementation of the PAMA sulfuric acid

plants project, reason for which the exceptional extension is being requested for this sole project.

### **3.1.1 LEGAL GROUNDS**

The PAMA for the metallurgical complex of La Oroya was approved by Board Resolution No. 334-97-EM/DGM on October 16, 1997, and its most recent revision, concerning solely the investment amounts, was approved by Board Resolution No. 28-2002-EM/DGAA on January 25, 2002. The completion deadline for the execution of the projects included in the PAMA commitment expires January 7, 2007.

In accordance with the investment requirements and project execution time, the performance of eight of the nine committed projects shall be completed within the set term, leaving the completion of the sulfuric acid plants project as pending.

On December 23, 2004, the government authorized the owners of the mining activity to request before the DGAAM the exceptional extension of the performance deadline of one or more specific projects included in the PAMA, approved by Supreme Decree No. 046-2004-EM, that allows an extension request of the completion deadline of the PAMA sulfuric acid plants project under a monitoring and follow-up program with civic participation. (See Annex III).

Our extension request is based on technical, economic, financial, environmental, and social reasons, as well as on the population health risk analysis study, supported by four informative workshops and three public hearings, conducted in the area and region. (See Annexes IV and V, respectively).

### **3.1.2 TECHNICAL GROUNDS**

The mitigation of the adverse effects of SO<sub>2</sub> and particulate matter contained in the gas emissions produced by the operations of the metallurgical complex requires the implementation of a system for the production of sulfuric acid. This alternative SO<sub>2</sub> fixation is the most viable as it is based on technology that is conventional, proven, and widely used in similar operations.

The gases produced by the metallurgical operations are not the most adequate for the production of sulfuric acid, due to high particulate matter content and low SO<sub>2</sub> concentration, requiring adjustments to be made to the different processes so as to obtain a gas stream with adequate amounts of SO<sub>2</sub> and dust, enabling the production of sulfuric acid. This reality demanded the execution of prior studies, requiring time and expenditures in order to estimate the level of investment and performance deadlines necessary for the conditioning of gases and the final construction of the plants, considering their implementation under ongoing



operative conditions so as to not affect the production of resources that would support the investment necessary for the environmental projects and others.

The pre-feasibility studies have defined the need to build two new sulfuric acid plants (one for the lead circuit and another for the copper circuit) given the different characteristics of the gases produced in the sintering plant of the lead circuit and those gases originating from the copper smelter.

This alternative requires, in the medium term, to modify the sintering of the lead circuit to separate and capture the gases with higher concentrations of SO<sub>2</sub>, and a technological change in the copper circuit, enabling the production of gases with adequate amounts of SO<sub>2</sub> concentration that may be treated in the new sulfuric acid plants.

Furthermore, the repowering of the current sulfuric acid plant is necessary for the treatment of SO<sub>2</sub> gases produced in the roasting of concentrates in the zinc circuit.

### 3.1.3 ECONOMIC AND FINANCIAL GROUNDS

The economic evaluations prior to the acquisition of La Oroya determined the EBITDA and average yearly net profits levels at over US\$ 86,000,000 and US\$ 46,000,000, respectively, for the 1998 – 2007 period. However, as a result of the deterioration of metals market conditions and a reduction in production output from year to year, the averages obtained in the past seven years total US\$ 35,620,000 and US\$ -12,490,000, respectively, lower than the estimated averages, as shown below:

Year	1998	1999	2000	2001	2002	2003	2004
Income from production output (*)	160.3	151.1	149.0	134.8	119.1	98.6	104.9
EBITDA(*)	70.5	51.7	42.9	37.2	21.0	3.8	22.3
Net (Loss) Income(*)	19.4	(13.2)	(23.7)	(27.8)	(30.3)	(26.3)	14.5

(\*) In US\$ millions.

This financial situation created an accumulated loss of US\$ 87,400,000 through December 31, 2004, severely affecting the company's liquidity and its ability to meet the required investment demanded by the PAMA and other projects. As such, during the 1998 – 2004 period, the quick (liquid) financial ratio indicates a 63% reduction in liquidity.

In order to comply with the PAMA projects' schedule, negotiations were entered into for financing the industrial liquid effluents treatment and wastewater treatment

projects, which could not be completed. As such, both projects are currently under execution using our own resources. This situation prevented the ability to generate the proper Cash Flow necessary for investments greater than those originally proposed in the PAMA that would have permitted the construction of sulfuric acid plants in 2006.

The proposal of this document is based on the consideration of new operative projects that would generate additional EBITDA, which, added to an improvement in the current metals market, would translate into a greater price participation in production output, enabling the development of a business plan that would cover the investments required for the 2005 – 2010 period.

The business plan considers an investment of US\$ 142.72 million for the PAMA environmental projects in the 2005 – 2010 period, which, added to the amount invested in the 1998 – 2004 period, amount to a consolidated total of US\$ 195.86 million for the 1998 – 2010 period.

According to that provided for in SD No. 046-2004-EM, we are herewith enclosing the Audited Financial Statements through December 31<sup>st</sup> for the years 2000, 2001, 2002, 2003 and 2004. These Financial Statements have been prepared in accordance with generally accepted accounting principles. (See Annex VI).

Within the 30 days subsequent to the enactment of the Ministerial Resolution approving the extension, DRP shall issue a financial guarantee to the Ministry of Energy and Mining, consisting of a bank issued letter of guarantee, jointly, unconditional, irrevocable, and automatically executed, valued at US\$ 20.82 million, equivalent to 20% of the price for constructing the sulfuric acid plants project, to be issued by a local banking entity, after DRP obtains a line of credit from the bank issuing the letter of guarantee, based on financial results obtained through October 31, 2005, and the projections made for 2006.

With respect to the trust fund, a draft of the agreement is enclosed (see Annex VII): "TRUST FUND UNDER ADMINISTRATION" that shall be entered into pursuant to that provided in SD No. 046–2004-EM.

The parties to the agreement are: DRP as trustor, BANCO WIESE SUDAMERIS (BWS) acting as trustee, and the DIRECTORATE-GENERAL OF MINING (DGM) of the MEM as beneficiary. The obligations of the Trustor (Clause 7), of the Trustee (Clause 8), the term of the Trust Fund, the tax obligations (Clause 21) and arbitration (Clause 23) are set forth in the agreement.

The purpose of the agreement is to create a TRUST FUND UNDER ADMINISTRATION, irrevocable and unconditional, under which DRP (the trustor), pursuant to that provided in article 274 and other pertinent articles of the Law, transfers, through the trust, future cash flows to BWS (the trustee) so that the latter may incorporate them into the TRUST PROPERTY, and earmark them to fulfill investment obligations approved by the Ministry of Energy and Mining for the

PAMA sulfuric acid plants project.

Meanwhile, the company has been taking actions to increase its liquidity, such as accelerating the collection period, searching for better commercial terms with providers, and reducing costs to meet all of its present and future obligations.

### **3.1.4 ENVIRONMENTAL GROUNDS**

The PAMA of the La Oroya metallurgical complex was geared towards the management of SO<sub>2</sub> emissions relating to the operation of sulfuric acid plants to meet the Maximum Permissible Limits (LMPs per their initials in Spanish) required by law. Notwithstanding, health risks arising from the past effects of lead (environmental liabilities), and from lead originating from current emissions, were not considered in any project whatsoever, dismissing their importance as a principal risk factor relating to the population's health and the urgency with which to address them.

According to studies conducted on: dispersion models of air quality (Annex VIII A), human health risks (Annex VIII B) and the consumption by mothers and children of lead, calcium, iron, and zinc in foods in La Oroya Antigua (Annex VIII C), and opinions formulated by DIGESA (Annex VIII D), the effects of SO<sub>2</sub> on the population's health are transitory by nature, while the effects of lead, from whichever of its sources, is chronic by nature due to exposure over long periods of time. The situation must therefore be urgently addressed as to the problem of lead emissions compared to SO<sub>2</sub> emissions, whose effects on the population have been mitigated through the reduction policy or interruption of certain operations due to phenomena of thermal inversion. On the other hand, while the potential for respiratory discomfort and irritation exists, as a result of short episodes of elevated levels of SO<sub>2</sub> in the air, these are momentary and reversible. As such, faced with the impossibility of simultaneously controlling all the environmental problems, it is possible to delay their final solution, and continue with the mitigation and control measures.

Concerning lead emissions in the environment, as observed in the assessment conducted by McVehil & Monet, fugitive emissions, in the same emissions volume, have a greater effect on air quality than chimney emissions.

On the other hand, based on experience from recent years, smelters in different parts of the world have revealed cases where, even when chimney emissions (from which LMPs are measured) are completely under control, Air Quality Standards (AQS) are not met given the effect of fugitive emissions. Our case is no exception, as the evaluations and past experience show us that compliance with the chimney emissions LMPs is insufficient to reduce lead levels to the levels set by the AQS.

The fact that the reduction of particulate matter containing lead entails the

reduction of other metals must be taken into account, as in the case of arsenic and cadmium, although the latter, according to monitoring results, is found in the environment in concentrations below the acceptable risk level determined by the U.S. EPA.

Moreover, a detailed study of fugitive emissions originating from smelter particulate matter has never been conducted, nor have measurements been taken of fugitive emissions originating from the plants' buildings.

However, an estimate was calculated based on data analysis on chimney emissions and on metallurgical balances, where it was estimated that approximately 326 t/year of lead emissions were being emitted.

For the aforementioned reasons, in addition to the proposal requesting the extension of term to 2010 for the PAMA sulfuric acid plants project, projects destined to reduce chimney emissions and fugitive emissions (both these types of emissions contain lead, arsenic and cadmium), as well as complementary paving projects, and projects for cleaning access routes to the chimney and city streets using street sweepers have all been included in the request. These projects should be completed by the end of 2006 and shall have a positive impact on improving the population's health.

### **3.1.5 SOCIAL GROUNDS**

The socio-economic importance of the metallurgical complex is significant as its contribution to the economic progress of La Oroya and the region is based on investments made so far and on its very operation. By using supplies, materials and services, of various types, several supply- and business-chains are created, making it the central engine for economic development.

La Oroya has 3,152 workers (2,446 on payroll, 202 under the civil construction regime, and 974 pertaining to third parties), implying a direct economic dependence on the metallurgical complex of 20,000 people. The economic study conducted by the company CELIDE between 1992 and 1993, estimated that this work group is responsible for 70% of business activities in the city of La Oroya.

The majority of La Oroya's workers reside in the central region of Peru: Junín, Huancayo, Jauja, Tarma, Carhuamayo, Cerro de Pasco, Huánuco, and other cities, for which the social effect the metallurgical complex of La Oroya has on the area extends to a large part of the central region.

According to legal analyses made by DRP, the operations of the La Oroya smelter (that has not yet completed its environmental adaptation process) without an approved PAMA is equivalent to operating against environmental regulations, with possible administrative and penal sanctions if the LMPs are not met, pursuant to the Peruvian Penal Code. As such, the Company is obligated to obtain the permit

from the Peruvian Government, through the request for an exceptional extension, to continue its operations through 2010 while adjustments are being made to meet environmental regulations.

Moreover, concerning the direct economic effect on the city of La Oroya, we must mention the domino effect an interruption of operations would have on the country's central region. As an example, we can detail some major payments DRP made in 2004 for various services and supplies:

Electroandes S.A.	US\$ 19.00 million
Railways	US\$ 2.48 million
Road transportation	US\$ 2.52 million
Purchase of concentrates	US\$ 393.12 million
Materials and reagents	US\$ 2.00 million

Another point to consider, in the case of the potential closure of the La Oroya metallurgical complex, is the difficulties small and mid-sized mining producers would face to position their concentrates abroad, given their low production volume and the complex polymetallic type of their concentrates, a problem that would affect their profitability and force them to close, in some cases, with the consequent effects of a regional economic downturn and an increase in unemployment.

DRP is making the necessary efforts so that the metallurgical complex and the city of La Oroya are viable over time, including actions to increase its competitive capacity in the current marketplace and environmental adaptation projects that would allow it to continue operating while complying with Peruvian law requirements.

We have also been working on a participative basis with the surrounding communities regarding improving their quality of life and achieving sustainable development.

To that effect, we have implemented a social responsibility program that, during recent years, has destined between US\$ 500,000 and US\$ 750,000 a year for the development of activities in the following camps:

**a) Work education – Youth Labor Training:**

The agreement for Youth Labor Training is governed by regulations established by the *Texto Único Ordenado* (T.U.O. or “Consolidated Amended Text”) of Legislative Decree No. 728, Law on Labor Training and Promotion, approved by Supreme Decree No. 002-97-TR, whose purpose is to provide young persons of both sexes,

between 16 and 25 years of age, theoretical knowledge in: business management, quality of life and project designs, as well as practical workshops on sanitary and electrical installations, civil construction, landscaping, forestry, and ecotourism, in a business environment, to include them in the economic activity.

The selection of young leaders is made through a popular assembly in the communities, while in La Oroya, Paccha and Santa Rosa de Sacco, the selection is made in coordination between the Community and the Municipality.

After the call is made for young people to participate, the company makes the final selection.

Each Youth Labor Training Program was initially comprised of three phases, each lasting for 3 months. After the first two phases concluded, the best participants of each phase were selected and a third phase was conducted to reinforce the theoretical knowledge and practical skills taught. Currently, the program has been consolidated into one sole phase that includes technical training in SENATI, and each person is assigned a monthly stipend of S/. 800. Additionally, DRP provides the participants with food, lodging, medical assistance, safety equipment and other benefits.

Twenty-two young people were selected from the Youth Labor Training Program to provide services to DRP as follows: 13 on payroll, 3 with a direct contract and 6 with service provider companies.

Since 1999, the year in which the first program began, to date, 547 young people have participated from 22 communities and annexes.

It should be noted that many of these young participants became presidents and/or leaders of their respective communities, breaking many years of tradition, where before only those with a long trajectory within their community could become authorities or community leaders.

## **b) Educational infrastructure**

To contribute to bettering the educational system by improving the infrastructure, and the health and environmental hygiene programs, basic hygienic services and the renovation of schools have been implemented. In La Oroya 8 schools were remodeled, with a total of 1,392 m<sup>2</sup> constructed and a total of 12,463 m<sup>2</sup> that underwent maintenance and refurbishment, benefiting 4,464 schoolchildren. Likewise, 13 educational centers were remodeled in the communities, totaling 2,880 m<sup>2</sup> constructed and a total of 9,794 m<sup>2</sup> that underwent maintenance and refurbishment, benefiting 1,702 schoolchildren.

In La Oroya, maintenance and refurbishment works were also performed, such as on the Medical Center (*Posta Médica*), the National Dining Hall No. 5, the Workers' Syndicate, the *Plaza Libertad* of La Oroya Antigua, the construction of a reservoir

for the supply of drinking water and the refurbishment of the venue *Hermandad del Señor de los Milagros*, totaling 1,780 m<sup>2</sup>. Construction works have been executed in the communities, such as guinea pig farms, an emergency medical tent for the Peruvian National Police, the refurbishment of the Santa Rosa de Sacco stadium's flooring, and the repair of the Chacamarca museum, totaling 14,192 m<sup>2</sup> of constructed and refurbished area.

DRP has established a permanent maintenance program for the executed works so that the infrastructure is permanently found in optimal conditions.

### **c) Improvement in livestock and genetic improvement**

In order to train and advise the communities as to the management of ovine, bovine and camelidae (llama) livestock, prevent parasitic diseases through the dosage of mineral salts, and improve the breed of livestock of the communities, by delivering better genetic livestock modules, to date the following has been delivered:

- 75 reproducing male ovine, of the Junín breed, to 11 communities.
- 70 ovine of the Hampshire Down breed to 7 communities (10 male and 60 female).
- 60 reproducing alpacas to 6 communities (30 male and 30 female).

The first evaluations in genetic improvement have shown that offspring weigh an average of 4 kilograms at birth, and weigh an average of 10 kilograms during their first month. The weight of the Hampshire Down breed surpasses 100 kilograms, whereas before the ovine the communities previously had reached an approximate weight of between 25 and 30 kilograms on reaching adulthood. Pilot research programs are also being conducted regarding the handling of smaller animals, such as guinea pigs (400 female), in five communities.

### **d) Improvement in pastures**

In order to train the communities on the cultivation of pastures, including the launch of pilot programs to improve seed quality and research the adaptation and attributes of special grass introduced in the central sierra, there are, currently, 73.24 cultivated hectares in 9 communities under the pilot programs.

It should be noted that, previously, the members of the communities did not have any measurement parameters for feeding their livestock, placing all of their animals into one sole pasture. They are now adopting the measure of one sheep per hectare and per year in natural pastures, and 25 to 30 sheep in cultivated pastures. This measure has considerably improved the weight of each sheep.

Through the implementation of dairy product production workshops and weaving

workshops, we are now working on projects to increase the added value of cow's milk, sheep's wool and Alpaca fiber.

### **e) Improvement in the landscape: Andean Forest Plantations and Landscaping**

These programs—which began in 2000 to reverse the false perception that in La Oroya, standing at more than 3,500 m.o.s.l, it is not possible to promote the development of vegetation, and to reduce the areas exposed to dust through forestry and landscaping programs—to date have had the following results:

- Forestry: 110,180 saplings planted, 39.6% in La Oroya and 60.1% in communities with approximately 10 hectares of forest areas.
- Landscaping: 113,207 m<sup>2</sup>, 64.9% in La Oroya and 35.1% in the communities.

These works have been conducted through campaigns with the voluntary participation of the population and, on many occasions, entire families.

Additionally, tourism is being promoted in the area, and two touristic circuits have been identified, highlighting as tourist attraction points the recreational park designed and built by DRP in La Oroya, various ruins surrounding the city, and the landscapes of neighboring communities.

### **f) Emergency support for the communities**

In accordance with the company's policy, technical support and machinery have been provided to the community, in general, for emergency situations, such as:

- El Niño phenomenon affecting the main highway in 1998. Machinery and personnel were provided for support, a cost equivalent to US\$ 637,710, acknowledged by the Ministry of Energy and Mining.
- Repair of the Jorge Basadre drains of the *Carretera Central* (main highway) that connects Lima with Cerro de Pasco and Selva Central del Perú, with a monetary participation of US\$ 100,000.
- Restoration of the highway Carpapata – Cobriza in Huancavelica, in an amount greater than US\$ 260,000 since 2000 to date.
- Cleaning of the *Carretera Central* in La Oroya, during rain seasons, after landslides, with the support of personnel and heavy machinery.
- The overflow of the Huari river, in March 2003, that swept away fish farms located in the annexes of the Huashapampa neighborhoods: Mezapampa, Ricardo Palma and part of Chacapalpa, affecting approximately between 30 and 80 thousand trout per owner, and the bridge connecting the Huari and Chacapalpa communities. Doe



- Run Peru participated by providing heavy machinery and qualified personnel for cleaning the riverbed and protecting the bridge's buttresses.
- Restoration of the highway connecting the Huari and Huayhuay communities.
- Maintenance of 70 km. of the irrigation canal located on the left bank of the Mantaro river, between Jauja and Huancayo, that benefited around 15,000 farmers from the Mantaro valley, with an investment of US\$ 100,000 and executed in two months.
- Participation of DRP in various actions supporting those communities affected by natural disasters.

**g) Support in health campaigns.**

In this respect, various health campaigns have taken place:

“A Smile in Los Andes” program, in June 2000. After a preliminary evaluation of 193 children, 99 children underwent cleft lip and palate surgery in 129 surgical interventions. Additionally, in June 2005, a new campaign took place where 102 children with cleft lips were operated on in 138 surgical procedures. This program took place with the participation of professionals of Rotaplast Internacional (USA) covering, without cost, the medical care of children from 6 departments of Peru.

The ophthalmologic surgery campaign, conducted by DRP and the *Instituto Nacional de Oftalmología del Perú*, between August 26 and 29, 2003. Thirty-two patients underwent surgery, 16 cases of cataracts and 16 of pterygium, including one eye enucleation (removal). Preliminarily, a total of 265 people were medically evaluated.

Both campaigns took place in the Chulec Hospital, owned by DRP, and all logistics, food and lodging expenses were assumed by DRP for the specialists and patients.

**h) Agreement with the Ministry of Health (MINSA per its initials in Spanish):**

DRP conducted a study of blood lead levels of La Oroya's population in 2000 – 2001, and initiated a series of preventive activities such as street cleaning and training in Educational Institutions to reduce exposure risks, through the creation of a new department called Environmental Hygiene and Health (HYSA per its initials in Spanish).

In July 2003, Agreement No. 008-2003-MINSA was signed between DRP and the Ministry of Health, represented by DIGESA, to reduce blood lead levels in children under the age of 6 years in La Oroya Antigua, additionally proposing the progressive integration of other public or private institutions toward the same end.

In March 2005, a program commenced for managing the health of children and expectant mothers through interventions such as:

- Promoting health: Streets were cleaned (20 monthly campaigns), with the participation of the Provincial Municipality of Yauli, as were educational institutes (14 monthly campaigns) and housing facilities (40 monthly campaigns).
- Personal hygiene program: providing showers to 600 children and 45 expectant mothers. Community participation is encouraged by the formation of Community Agents who, to date, are 200 mothers of families from La Oroya Antigua and who participate in this activity.
- In matters concerning health education, 300 parents, 50 teachers and 310 students from Inicial, PRONOEIS and “Pietbaff” are trained per year.

In matters concerning health services and medical care, various evaluations are conducted by area of specialization:

- In pediatrics, more than 100 children are seen per month.
- In psychology, individual and family attention is offered to children through 45 sessions provided per month.
- In the areas of growth and development, a nutritional care program was implemented for 150 children, the same that attend PRONEIS and Pietbaff.
- A social evaluation is underway of the almost 800 children attended to.

Concerning individual attention, a Nursery School in Casaracra was set up for children with blood lead levels higher than 45 µg/dl. Currently, there are 56 children in the program called “temporary absence”, with an average stay of 8 hours a day from Monday through Friday—these same children receive early childhood development stimulation, nutritional care (breakfast and lunch), personal hygiene and evaluation, and medical, psychological, nutritional and social treatment.

New areas of influence have been added to the Blood Census II, initiated on October 24, 2005, such Las Mercedes - Norman King and Tallapuquio, in the Oroya Nueva (New Oroya), as well as the areas of Huari and Paccha, where actions have been conducted in coordination with the authorities. To date, the Epidemiological Registration and Evaluation Clinic and laboratory is progressing, with almost 400 children and 20 newborns registered.

### **i) New business creation**

The purpose of this program is to promote the creation of small businesses in La Oroya to improve the quality of life of the population by creating their own income.

To date, since the inception of the program in 1999, the following has occurred:

- The creation of 33 businesses, with a total of 16 participants.

- The formalization of two micro businesses: “El Trigo” and “Estilos y Modas”.
- Group and family businesses: Bakeries and Pastry shops (16), Dairy Products (3), Sweets and Chocolates (3), Woven Textiles (1), Textile Products (4) Crafts (4), Knitted Fabrics (2) and the Production of Cards.

#### **j) Environmental education campaigns**

DRP, to educate the population on preventive measures against contamination, especially lead, created the department Environmental Hygiene and Health (HYSA per its initials in Spanish) to conduct cleaning campaigns and create educational centers, with the voluntary participation of the population, teachers, students and parents.

To date the following results have been obtained:

- In school cleaning campaigns: 123 campaigns, 9,725 participants including students, teachers and parents, using 244,325 gallons of water and picking up 66 m<sup>3</sup> of trash; and in neighborhoods: 619 campaigns, 57,788 voluntary participants, using 1,090,948 gallons of water and picking up 327 m<sup>3</sup> of trash.
- In Health and Hygiene, we have trained over 180 women leaders in the community through workshops on nutrition and personal hygiene.
- In activities promoting health directed to the population, a total of 1,665 people have participated in the forestry campaigns (477 children and 1,188 adults) in 11 events.

Concerning social campaigns, since September 2000, a program has been created for children socially at risk or at risk of being abandoned in the city of La Oroya, called “Social and Human Ecology Program”. The participants are chosen for this program after a rigorous evaluation of social abandonment.

Currently, there are 140 children participating in the programs, enjoying the following benefits: one daily nutritionally balanced lunch, at no cost, served in the National Dining Hall 5 of La Oroya (a venue completely remodeled by DRP and supervised by a nutritionist) and hygiene sessions provided in the hygiene modules and showers located in the *Malecón Odría* of La Oroya Antigua (built by DRP), with periodic anthropomorphic evaluations and monthly weight/quarterly height measurements to identify any risks from malnutrition in order to address them immediately. Additionally, jointly with Social Services personnel, education is reinforced twice a week and coordinated actions are made with the Health Center (SIS) and the participation of mothers of families in the Family Planning Program.

## 3.2 DESCRIPTION OF THE PAMA SULFURIC ACID PLANTS PROJECT

### 3.2.1 INTRODUCTION

DRP's business plan for 2006 – 2010 includes the following yearly production levels:

- **43,650 MT of refined zinc.**
- **122,000 MT of refined lead.**
- **72 500 MT of refined copper.**

According to this plan, the input of zinc, copper and lead concentrates is considered, which represents, according to the mass balance, a net revenue of **422.92 MT/day of sulfur.**

As indicated in Annex of the MR No. 315-96 EM/VMM, the maximum permissible level of anhydride sulfurous emissions (SO<sub>2</sub>), for our case, is **175 MT/day**, as shown in the section of table 3.2.1/1. These emissions are equivalent to **85.5 MT/day** of sulfur and determines, in our case, a total fixture of **79.3%** of the total amount of sulfur entering the process.

**Table 3.2.1/1**  
**MAXIMUM PERMISSIBLE LEVELS OF SULFUROUS ANHYDRIDE EMISSIONS**  
**FOR MINING-METALLURGICAL UNITS**

SULFUR ENTERING THE PROCESS t/d	MAXIMUM PERMITTED EMISSIONS OF SULFUROUS ANHYDRIDE (t/d)
301-400	155
401-500	175
501-600	195

Considering that **3.7%** of the sulfur is fixed, equivalent to **15.10 MT/day**, in different sub-products and residue (table 3.2.1/2), to comply with that provided in the MR, the remaining **75.6%** must be fixed as commercial sulfuric acid, equivalent to a production of **363,069 MT/year.**

For this level of annual production of commercial sulfuric production, and according to the following studies:

- Pre-feasibility study for handling dust and capturing sulfur in the metallurgical complex of La Oroya;
- Assessments of the current sulfuric acid plant: Plant Performance and Expansion;
- Technical feasibility study of the current sulfuric acid plant; and
- Analysis of the sintering machine of La Oroya,

and other analyses conducted by DRP, the operation of three plants has been defined to meet the previously mentioned (sulfur) fixing requirements.

**Table 3.2.1/2**  
**FIXING OF SULFUR IN SUB-PRODUCTS AND RESIDUE**

CIRCUIT	SULFUR INPUT, MT/day	FIXED SULFUR, MT/day	FIXTURE, %
ZINC	76.17	3.51	4.6
LEAD	157.98	0.65	0.4
COPPER	188.77	10.93	5.8
<b>TOTAL</b>	<b>442.65</b>	<b>15.09</b>	<b>3.7</b>

Chart 3.2.1/1 shows the arrangement of the zinc, lead and copper circuits for implementing the technological changes and the new sulfuric acid plants.

To cover the previously mentioned total production of sulfuric acid, to reach the level of SO<sub>2</sub> emissions provided for by the corresponding MR, the following production scheme has been defined:

1. Repowering of the current sulfuric acid plant to reach a nominal production capacity of 60,000 MT/year of commercial sulfuric acid.
2. Construction of a new plant with a nominal production capacity of 115,000 MT/year of sulfuric acid to treat the sulfurous gases produced in the lead smelter's sintering machine.
3. Construction of a new plant with a nominal production capacity of 200,000 MT/year of sulfuric acid based on the gases originating from the smelting furnaces and conversion from the copper furnace.

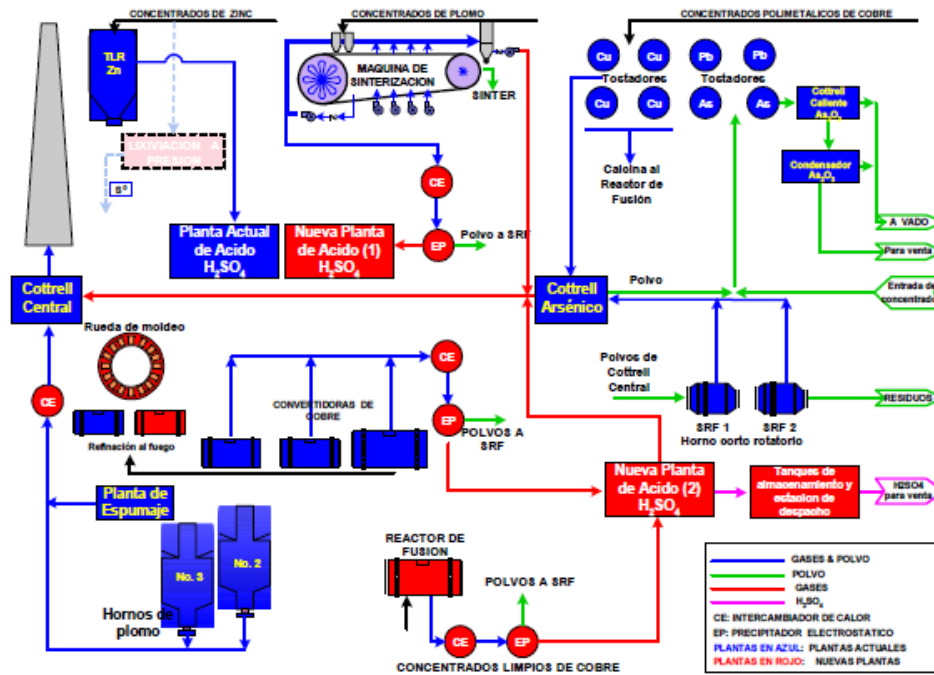
The operation of the three plants, whose total nominal capacity is 375,000 MT/year of sulfuric acid, will lead the production of the 363,069 MT/year considered in the study. The annual production of sulfuric acid shall depend on the volume of treated concentrates and on sulfur contents.

Annex IX A shows: Engineering development plans, showing the location of the three mentioned plants, within the La Oroya metallurgical complex.

Table 3.2.1/2 shows, for each plant, the estimated yearly investment and the execution periods thereof.

The scope of each of the three subprojects, included in the PAMA sulfuric acid plants project, are described in the following chapters.

**Chart 3.2.1/1  
PRELIMINARY GENERAL ARRANGEMENT FOR THE SULFURIC ACID PLANT**



**Table 3.2.1/2  
INVESTMENT SCHEDULE FOR 2005 – 2010  
(in US\$ million)**

SULFURIC ACID PLANTS	2005	2006	2007	2008	2009	2010	TOTAL INVEST. '05 – '10
REPOWERING OF CURRENT PLANT IN ZINC CIRCUIT (60,000 T/YEAR)	0.8	2.3					3.1
NEW PLANT FOR LEAD CIRCUIT (115,000 T/YEAR)	0.2	2.0	20.0	9.0			31.2
NEW PLANT FOR COPPER CIRCUIT (200,000 T/YEAR)	0.4	0.7	5.0	16.0	25.0	24.0	71.1
<b>TOTAL US\$ MILLION</b>	<b>1.4</b>	<b>5.0</b>	<b>25.0</b>	<b>25.0</b>	<b>25.0</b>	<b>24.0</b>	<b>105.4</b>

### 3.2.2 REPOWERING OF THE CURRENT SULFURIC ACID PLANT

Zinc sulfured concentrates are treated in a fluid bed Lurgi roaster within the zinc circuit, where sulfurous gases produced are sent and treated in a sulfuric acid plant built by Panamerican in 1967 with a Monsanto license.

#### Objective

Guarantee the operational continuity of the current sulfuric acid plant for a nominal production of 60,000 MT/year of commercial quality sulfuric acid based on the

sulfurous gases produced in the Luigi roaster.

## **Description**

The project consists in replacing all smelted iron serpentine coolers with a new, plated and compact cooler to meet the needs of the drying tower, and replacing the absorption and cooling tower used for the produced sulfuric acid. This will enable us to free up space for the construction of a new drying tower with its respective retention tank, without affecting the plant's operation or interrupting the current fixing of SO<sub>2</sub> as sulfuric acid.

## **Current situation**

Detail engineering is currently being developed by the Canadian company Fleck Chemical Industries Inc. (FCII) to replace the following main equipment: A new drying tower and retention tank for the drying tower pump, in addition to the design of acid pipes and gas pipelines relating to the installation of the new, previously mentioned, equipment. The specifications for the purchase of new acid coolers are included.

According to the list of documents agreed to in the FCII contract, an advance of 70% shall be made on delivery of the blueprints and 90% on delivery of the technical specifications and documents for the proposals' requirements.

On its part, DRP is working on the logistics for the acquisition of required specialized materials, equipment and services. In this regard, a 60% progress has been made.

The total budgeted amount for these studies is US\$ 160,000.

**Executed investment:** US\$ 81,000 (through October 2005)

**Projected total investment:** US\$ 3,100,000.

**Schedule of activities:** The detail engineering shall be completed in January 2006, and the implementation in December of the same year, as shown in the execution schedule of Annex IX B and IX C.

### **3.2.3 NEW SULFURIC ACID PLANT FOR THE TREATMENT OF SULFUROUS GASES PRODUCED IN THE LEAD SINTERING MACHINE**

Currently, the sintering machine of the lead smelter produces sulfurous gases which are sent to the dust cleaning system of Central Cottrell, and subsequently discharged through the main chimney as SO<sub>2</sub> gases.

In the sintering machine, gases from the reaction zone, with a high concentration of

SO<sub>2</sub>, are mixed with gases from the cooling zone that contain a low percentage of SO<sub>2</sub>, and the mix is sent to Central Cottrell.

## **Objective**

To treat, in a new sulfuric acid plant, sulfurous gases originating from the reaction of the sintering machine because of their greater SO<sub>2</sub> concentration for fixing sulfur as sulfuric acid.

## **Description**

The project is comprised of two parts:

- The conditioning of the sintering machine to capture only gases with higher SO<sub>2</sub> concentration from the reaction zone and send them to the new sulfuric acid plant.
- Construct a new plant, with a nominal production capacity of 115,000 MT/year of commercial sulfuric acid, that will have three operative stages:
  1. Cleaning of gases.- Those gases with the highest SO<sub>2</sub> concentration captured in the lead sintering machine are received in the gas cleaning section, where they shall be cooled and humidified, and particles removed to prevent the wear and tear of equipment that could affect the quality of the acid produced.
  2. Contact section.- Receive the gas treated in the cleaning section, remove humidity from the process gas and catalytically convert SO<sub>2</sub> to SO<sub>3</sub>, where the latter is absorbed in diluted acid to produce commercial grade sulfuric acid concentrated at 98.5%.
  3. Storage and distribution.- The produced commercial sulfuric acid is stored in specially conditioned tanks and distributed by a loading system via rail and highway to the transfer and/or consumption points.

## **Current situation**

The technical feasibility study for optimizing/modifying the sintering machine and determining the flow and concentrations to capture the portion of gases with the highest SO<sub>2</sub> concentration, to enable the production of sulfuric acid, has been completed.

In order to take measurements to define the production zone of gases with the highest SO<sub>2</sub> concentration, two mobile curtains have been manufactured that will be installed in the sintering machine, together with the respective expansion joints



to avoid the entry of false air and, consequently, the unwanted dilution of the gases.

The basic engineering for this project is under execution, by FCII, as is the definition of the investment cost estimate +/- 20%, for the new sulfuric acid plant.

The scope of the development of basic engineering includes equipment for the following sections:

1. Gas cleaning section.
2. Weak acid section.
3. Contact section.
4. Strong acid section.

An advance of 100% was made regarding the blueprints and the investment cost estimate.

The total budgeted amount for these studies is US\$ 130,000.

**Executed investment:** US\$ 80,000 (through October 2005)

**Projected total investment:** US\$ 31.20 million.

**Schedule of activities:** Basic engineering shall be completed by December 2005, and the implementation of the new sulfuric acid plant shall be in December 2008, as shown in the execution schedule of Annex IX B and IX C.

### **3.2.4 NEW SULFURIC ACID PLANT FOR THE TREATMENT OF SULFUROUS GASES PRODUCED IN THE COPPER SMELTER**

The current copper smelter has three important sulfurous gas emission points: The partial roasting process of concentrates, the fusion of calcine in the oxy-fuel reverberator, and the Pierce-Smith (PS) converters. All gases are sent as a whole to the dust recapturing systems (Arsenic Cottrell and Central Cottrell), to later be sent to the chimney and discharged into the environment as SO<sub>2</sub> gases.

The mix of gases deriving from the reverberator and converters is very diluted in SO<sub>2</sub>, as such the production of sulfuric acid based on this mixture is not technically feasible, requiring the implementation of technological changes that enable the generation of gases with an adequate concentration of SO<sub>2</sub> that make its fixing as sulfuric acid feasible.

#### **Objective**

To treat, in a new sulfuric acid plant, those sulfurous gases deriving from the

smelting of concentrates and the conversion stage for fixing SO<sub>2</sub> as sulfuric acid.

## **Description**

The project consists of two stages:

- A technological change for the processing of copper concentrates, replacing the current reverberator for a bath fusion reactor and modifying the copper conversion process.
- Construct a new plant with a nominal production capacity of 200,000 MT/year of commercial sulfuric acid, that will have the following operative stages:
  1. Cleaning of gases.- The mixture of gases with a high SO<sub>2</sub> concentration (between 12% and 15%) deriving from the bath fusion reactor of sulfurous concentrates and PS converters are received in the gas cleaning section, where they shall be cooled and humidified, and particles are removed to prevent the wear and tear of equipment that may affect the quality of the acid produced.
  2. Contact section.- Receive the gas treated in the cleaning section, remove humidity from the process gas and catalytically convert SO<sub>2</sub> to SO<sub>3</sub>, where the latter is absorbed in diluted acid to produce commercial grade sulfuric acid concentrated at 98,5%.
  3. Storage and distribution.- The produced commercial sulfuric acid is stored in specially conditioned tanks and distributed by a loading system via rail and highway to the transfer and/or consumption points.

## **Current situation**

Profile engineering has been completed concerning the modernization of the copper circuit, involving the technological change of the fusion unit to a bath fusion reactor to replace the current oxy-fuel reverberatory furnace, and the integral engineering feasibility study is under development, for the smelter to recover and control targeted materials, by the consortium INDEC-IM2-CODELCO.

Conceptual engineering is under development, as is the capital costs estimate +/- 30%, handled by FCCI, for the new sulfuric acid plant that shall process gases originating from the smelting operations and conversion operations of the copper smelter. The scope of the development of conceptual engineering includes equipment for the following sections:

1. Gas cleaning section.
2. Weak acid section.
3. Contact section.

#### 4. Strong acid section.

An advance of 20% was made on the delivery of: preliminary blueprints, technical specifications for all new equipment, plans for the general arrangement [of the plant], design criteria for the installation of the main equipment, description of the process, and a capital costs estimate.

The total budgeted amount for these studies is US\$ 330,000.

**Executed investment:** US\$ 10,000 (through October 2005)

**Projected total investments:** US\$ 71,100,000.

**Schedule of activities:** Conceptual engineering shall be completed in January 2006, and the implementation of the new sulfuric acid plant shall take place in December 2010, as shown in the execution schedule of Annex IX B and IX C.

### 3.2.5 SULFURIC ACID MARKET AND TRANSPORTATION

Given the sulfuric acid marketplace is characterized by its shifting and emerging schema, studies projecting its consumption are continuously being updated. Regarding market projections for our programmed production in 2009 and 2011, a recent consumer market study in Chile deems our potential offer at an estimated production rate of 355,000 MT/year (See Annex IX D).

There are three alternatives, according to international standards, for the transportation of sulfuric acid:

- Rail.
- Highway.
- Mixed (rail and highway).

We are currently using the mixed transportation alternative to transport sulfuric acid to the consumption points, especially to the cities of Lima and Callao. Concerning the transportation of production, a technical-economic proposal is available for highway transportation (See Annex IX E).

With respect to storage and delivery requirements in Callao, we have a technical-economic offer for a loading terminal (See Annex IX F).

Finally, we have an environmental management plan for the transport of sulfuric acid that has been in use for the provision and delivery of this product to the BHP Billiton Tintaya mine (See Annex IX G), and shall be used for future transportation.

## **4 PRIORITY PROJECTS FOR ENVIRONMENTAL MITIGATION SUGGESTED BY THE HEALTH RISK STUDY**

As a result of the health risk study analysis, enclosed as Annex VIII B, the risk factor that requires the most urgent attention is controlling lead emissions—as an immediate solution to their impact on the population, as part of our request for the extension of the deadline to complete the sulfuric acid plants project, we are including new projects for reducing chimney dust emissions and fugitive emissions. These projects—in addition to the execution of paving and cleaning projects, all with the same objectives—shall be completed by the end of 2006. The mentioned priority projects of environmental mitigation are described below.

### **4.1 REDUCTION OF CHIMNEY PARTICULATE MATTER EMISSIONS**

This project is comprised of four subprojects later defined in the evaluation of dust capturing systems for the complex's different plants.

The total budget for this project is US\$ 2,550,000 and the different subprojects comprising this project shall be completed by the end of 2006.

#### **Objective**

Reduce chimney particulate matter emissions containing lead, improving the efficiency of collection systems to increase and optimize the capture of dust.

#### **Process description**

To attain this objective, the following subprojects have been considered:

##### **a) Baghouse for lead furnaces**

Process gases deriving from the lead furnaces are currently sent to units 13, 14 and 15 of Central Cottrell to be cleaned with a low efficiency of 96.7%. To improve the capture of dust deriving from these gases, a baghouse shall be installed to achieve a minimum efficiency of 99.0%. This project shall help to free up units 13, 14 and 15 of Central Cottrell so that they may be used to expand the process gases cleaning area of the copper converters currently used by units 7, 8, 9, 10, 11 and 12.

This arrangement for the dust capture system will reduce chimney particulate matter emissions by 0.48 MT/day or 175.2 MT/year.

##### **b) Conditioning of units 1, 2 and 3 of Central Cottrell for the sintering plant.**

Currently, process gases from the sintering machine are sent to units 4, 5 and 6 of Central Cottrell for cleaning. It has been deemed convenient to expand the gas

cleaning area and dust capture efficiency by using units 1, 2 and 3 of Central Cottrell, freed up because of the discontinuation of operations of the Zinc Circuit's three New Jersey roasters (Fluid Bed Roaster) in December 2004.

The reduction in the loss of chimney particulate matter due to the increase in the efficiency of dust capturing is estimated at 0.14 MT/day or 51.1 MT/year.

**c) Baghouse after arsenic kitchens.**

The process gases from the copper roasters containing arsenic are cleaned in the Arsenic Cottrell with a low efficiency of 96.7%, emitting leftover gases through the chimney. The project involves the installation of a baghouse to capture arsenic dust when it is emitted through the arsenic trioxide condensation units, to decrease the dust load to the Arsenic Cottrell, improving its efficiency. The reduction in chimney dust loss is estimated at 0.40 MT/day or 146 MT/year.

**d) Baghouse for lead foam reverberatory furnace.**

The project involves the installation of a baghouse to capture dust contained in the gases of the reverberatory furnace that processes lead foam. This leads to the reduction of dust load sent to units 16, 17, 18, 19, 20 and 21, which shall then only be used to clean gases deriving from the copper reverberators. The reduction in the loss of chimney particulate matter is estimated at 0.09 MT/day or 32.85 MT/year.

The capacities of the bag filters are based on the following design criteria:

- For the lead furnaces baghouse: 150,000 ACFM, 500 HP and a gas temperature of 80 °C.
- For the arsenic kitchen baghouse: three 2,000 ACFM units (10% of capacity), 10 HP and a gas temperature of 260 °C.
- For the foam reverberatory furnace baghouse: 15,000 ACFM and a gas temperature of 1,000 °C when exiting the furnace.

**Current state**

Through October 31, 2005, the following progress has been made:

- a) Detail engineering is under development for the lead furnaces baghouse. The invested amount for this subproject is US\$ 28,000.
- b) For the conditioning of the Central Cottrell units 1, 2 and 3, works are currently being performed to condition the pipelines, and the purchase of the collection plates is currently underway. US\$ 62,000 has been invested.
- c) Concerning the baghouse for the arsenic kitchens, a process is underway to

purchase the prototype collectors for testing that will later serve as a basis for the selection of materials.

- d) Detail engineering is under development concerning the baghouse for the foam reverberatory furnace,

## **Schedule**

The schedule for the subprojects is included in Annex X A, as well as representative engineering blueprints.

## **4.2 REDUCTION OF PARTICULATE MATTER IN FUGITIVE EMISSIONS**

The study conducted by McVehil – Monnet demonstrated the significant environmental impact fugitive emissions have. As such, the execution of subprojects included in this section shall improve air quality, particularly the lead levels.

The total budget for this project is US\$ 8.78 million and the subprojects included in this project shall be operative by the end of 2006.

### **Objective**

To control significant fugitive emissions originating from the metallurgical complex's different operations, by reducing particulate matter emissions containing lead.

### **Process description**

To reduce fugitive emissions of the metallurgical complex, the following subprojects shall be performed:

#### **a) Repowering of ventilation systems A, B, C and D of the sintering plant.**

The sintering plant's current ventilation system, including the transfer points at the return bands and bucket elevation, has two baghouses and two gas scrubbers of low efficiency in dust recapturing. The project involves repowering the existing baghouses of system A, the installation of a baghouse in system D, and replacing the system C scrubber with a baghouse.

These modifications and additions will increase efficiency in capturing dust, reducing the amount of lead in fugitive emissions from 0.31 MT/day to 111.98 MT/year.

#### **b) Enclosure of lead furnaces and foaming plant buildings.**

The project entails the enclosure of the lead furnaces deck board and the enclosure of the foaming plant, finishing with the installation of a ventilation system that includes ducts, ventilators, and a baghouse for cleaning air contained inside the enclosures. The reduction of lead in fugitive emissions is estimated at 0.22 MT/day or 78.84 MT/year.

**c) Handling of lead circuit smelting beds.**

The project involves the installation of lateral enclosures for the buildings where the smelting beds are prepared for the smelting of lead, including the installation of a water sprinkler system (sprays) at roof level, to maintain proper humidity when weather conditions demand it, and prevent the wind from dragging concentrate particles towards the surrounding areas.

**d) Handling nitrous gases at anodic waste plant.**

The nitrous gases produced during short periods of time and evacuated through a low-height chimney near the cupellation furnaces shall be treated in a “scrubber” system to absorb them, eliminating their discharge into the environment.

**e) Handling smelting beds of the copper circuit.**

Similar to the lead smelting beds project, this project involves the installation of lateral enclosures for the buildings where the smelting beds are prepared for smelting copper, including the installation of a water sprinkler system, at roof level, to maintain proper humidity when weather conditions demand it, and prevent the wind from dragging concentrate particles towards the surrounding areas.

**f) New ventilation system for the anodic waste plant building.**

The project involves the installation of a baghouse system to capture environment gas dust originating from the plant to control fugitive emissions from the different processes of the anodic waste plants.

The design criteria taken into consideration for the main aforementioned subprojects are:

- Enclosure and ventilation system of the lead furnace and foaming plant buildings: the design to ventilate the buildings was based on the number of air renovations, that is, 12 times an hour.
- Handling the lead and copper smelting beds: Based on wind direction data and the physical characteristics of the concentrates, flux and recirculated material mixtures, that comprise the smelting beds.

**Current state**

To date, the present state of, and investments made in, the subprojects are:

- a) Repowering of ventilation systems A, B, C and D of the sintering plant: The materials for the ventilation systems are currently in the process of being purchased, and detail engineering is under development by BHA Group, with an investment of US\$ 113,000.
- b) Enclosure of lead furnace and foaming plant buildings: Undergoing testing and operational adjustments. This project was initiated in October 2003 and shall be completed in 2006, with an investment of US\$ 5,000,000.
- c) Handling of lead and copper smelting beds: detail engineering is being developed by ARSAC. The amount invested is US\$ 8,000.
- d) Handling of nitrous gases at the anodic waste plant: The study presented by ALANCO PERU is under revision. The invested amount is US\$ 4,000.
- e) New ventilation system for the anodic waste plant building: Ventilation materials are currently being purchased from the company BHA. The amount invested is US\$ 1,000.

## **Schedule**

The schedule for the subprojects is included in Annex X B, in addition to the representative engineering blueprints.

### **4.3 COMPLEMENTARY ENVIRONMENTAL PROJECTS**

This group of projects includes the paving of access routes to the different smelting and refinery plants, and the operation of two industrial sweepers assigned to, first, clean the paved areas in the smelter and, second, clean the streets of La Oroya.

#### **Objective**

Decrease the environmental impact produced by wind effects and particulate matter carried to the access routes and internal routes of the industrial zone, and to the streets of La Oroya.

#### **Description**

The paving project involves progressive paving work on the internal walkways of the metallurgical complex to control the environmental impact caused by particulate matter arising from vehicle traffic, preventing dust, concentrates and other materials from being dragged toward the industrial zone's exterior. This subproject complements the subproject involving the acquisition of two industrial street sweepers for the permanent cleaning and collection of dust in the paved areas of the smelter and the city of La Oroya.



**Current situation**

The progressive paving plans for the access routes are under development, to define the execution schedules and budget, and two industrial street sweepers have been acquired which are currently in operation.

For 2005 and 2006, there shall be a total estimated investment of US\$ 2,400,000.

**Schedule**

The schedule for the subprojects is included in Annex X C, in addition to the representative engineering blueprints.

## 5 ENVIRONMENTAL OBJECTIVES AND GOALS

DRP has prioritized the handling of particulate matter emissions containing lead given their high health risk factor, compared to the handling of SO<sub>2</sub>. The plan for managing particulate matter emissions, in addition to a significant reduction in lead content, will enable the reduction of other metals such as arsenic and cadmium.

The consolidated Environmental Plan (table 1.6/1) shows investments made during 1998 – 2004 and those budgeted for 2005 – 2010. The investments considered for this second period are directed toward obtaining the following specific environmental objectives:

1. Control fugitive emissions.
2. Control chimney emissions.
3. Control liquid effluents.
4. Control sulfur dioxide emissions (SO<sub>2</sub>) emitted through the chimney.

The first three objectives targeted for 2007, table 5/1, will be met by taking the following actions:

- a) Enclosures and the implementation of ventilation systems for the foaming plant buildings and load floor of the lead furnaces.
- b) Repowering of ventilation systems A, B, C and D of the sintering plant.
- c) Environmental handling of the copper and lead smelting beds.
- d) New ventilation systems for the anodic waste plant building.
- e) Installation of baghouses for the lead smelting furnaces, lead reverberatory furnaces and the arsenic trioxide condensers.
- f) Conditioning of units 1, 2 and 3 of Central Cottrell for cleaning gases from the sintering plant.
- g) Progressive paving of the industrial area and two operative street sweepers, one for the industrial area and another for the city.
- h) Start-up of the industrial waters plants and a tire washer system.
- i) Start-up of three wastewater treatment plants.

And the goals of the fourth objective will be met, sequentially, between 2007 and 2010 by taking the following actions:

- j) Repowering of the current sulfuric acid plant of the Zinc Circuit at the beginning of 2007.
- k) Operation of the new sulfuric acid plant for smelting lead at the beginning of

2009.

l) Modernization of the copper smelter to be completed by 2010.

m) Operation of the new sulfuric acid plant for the smelting of copper at the beginning of 2011.

**Table 5/1**  
**SPECIFIC COMPANY ENVIRONMENTAL OBJECTIVES AND GOALS**  
**2007-2011**

Specific objective	Unit	MEM Legal Requirement	Baseline	Goal 2007	Goal 2009	Goal after 2010
Control atmospheric emissions originating from the chimney	Pb = mg/m <sup>3</sup> As = mg/m <sup>3</sup> Cd = mg/m <sup>3</sup> Dust = mg/m <sup>3</sup>	<u>M.R. 315-96</u> <u>EM/VMM</u> <u>Measured at any time</u> Pb = 25 As = 25 Cd = not regulated Dust = 100	Pb=31 As=16 Cd=1.0 Dust=96	Pb=22.5 As=13 Cd=0.9 Dust=79	Pb=15.5 As=8.0 Cd=0.5 Dust=50	Pb=13 As=6 Cd=0.3 Dust=20
	Actions			e) and f)	k) and l)	m)
Control Sulfur Dioxide (SO <sup>2</sup> ) emissions	t/day	<u>M.R. 315-96</u> <u>EM/VMM</u> <u>Annex 1</u> 195	807	800	600	150
	Actions			j)	k) and l)	m)
Control Fugitive Emissions/Dust Re-suspension	Emission	<u>Not regulated</u>	Not applicable	--	--	--
	Actions			a), g), h)	a), g), h)	a), g), h)
Control Liquid Effluents	pH TSS=mg/l Pb=mg/l Cu=mg/l Zn=mg/l Fe=mg/l As=mg/l Cd=mg/l	<u>M.R. 011-96</u> <u>EM/VMM</u> <u>Annex 1</u> <u>Yearly</u> <u>Average Value</u> pH: ≥6 and ≤9 TSS=25 Pb=0.2 Cu=0.3 Zn=1.0 Fe=1.0 As=0.5 Cd= not regulated	TSS=499 Pb=3.1 Cu=1.0 Zn=115 Fe=7.0 As=1.3 Cd=0.5 DBO=108	pH: ≥6 and ≤9 TSS=25 Pb=0.2 Cu=0.3 Zn=1.0 Fe=1.0 As=0.3 DBO=15	pH: ≥6 and ≤9 TSS=25 Pb=0.2 Cu=0.3 Zn=1.0 Fe=1.0 As=0.3	pH: ≥6 and ≤9 TSS=25 Pb=0.2 Cu=0.3 Zn=1.0 Fe=1.0 As=0.3
	Actions			h) and i)	h) and i)	h) and i)

With respect to the gas emissions of the metallurgical complex, below is a description of the effects that shall occur after the performance of the corresponding above mentioned actions are completed.

## 5.1 REDUCTION OF LEAD IN FUGITIVE EMISSIONS

According to studies conducted by McVehil – Monnet, in its air quality dispersion

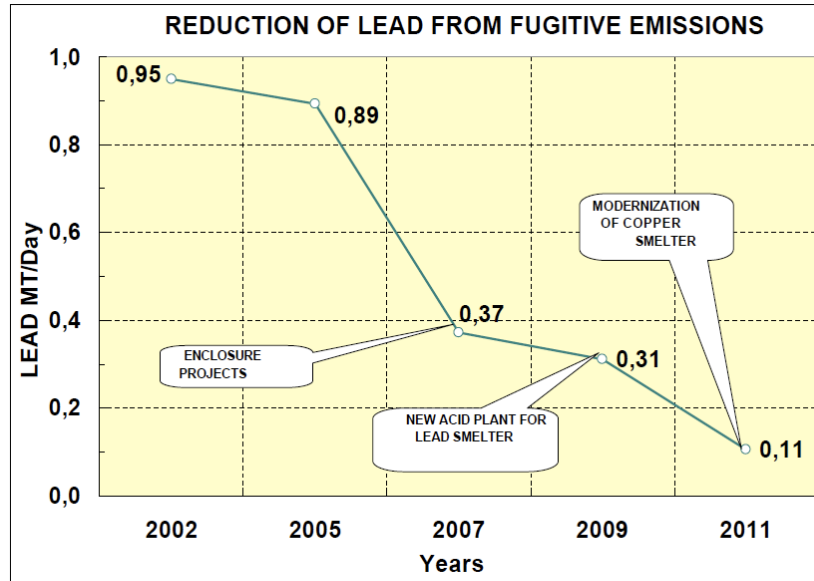
model for human health risk, the estimated level of fugitive emissions of the measurements taken, and the application of the dispersion model taking into account the mitigation projects or actions previously mentioned, we can predict future reductions in emissions, above all, lead emission.

Regarding the reduction of lead in fugitive emissions, we predict a significant reduction between 2005-2007 from 0.89 to 0.37 MT/day as a result of the implementation of the repowering project for ventilation systems A, B, C and D of the sintering plant, and the enclosure of the lead furnace and foaming plant buildings. For 2009, these emissions will be reduced to 0.31 MT/day, as a result of the start-up in operations of the new lead sulfuric acid plant. Finally, by 2011, levels should reach 0.11 MT/day after the implementation of technology changes in the copper smelter. The projected reduction can be observed in table 5.1/1 and Chart 5.1/1.

**Table 5.1/1  
REDUCTION OF LEAD IN FUGITIVE EMISSIONS**

<b>LEAD, MT/DAY</b>	<b>2002</b>	<b>2005</b>	<b>2007</b>	<b>2009</b>	<b>2011</b>
<b>FUGITIVE EMISSIONS:</b>					
Scrubber from sintering plant	0.310	0.318	0.011	0.011	0.011
Sub total	0.318	0.318	0.011	0.011	0.011
<b>Building roof openings</b>					
Copper roasters	0.164	0.164	0.164	0.164	0.042
Copper converter hallway	0.110	0.110	0.110	0.110	0.028
Lead furnaces	0.164	0.110	0.002	0.002	0.002
Foaming plant	0.110	0.110	0.002	0.002	0.002
Sub total	0.548	0.493	0.278	0.278	0.074
<b>Building fugitive emissions</b>					
Sintering plant	0.082	0.082	0.082	0.021	0.021
Sub total	0.082	0.082	0.082	0.021	0.021
<b>TOTAL FUGITIVE EMISSIONS</b>	<b>0.948</b>	<b>0.893</b>	<b>0.372</b>	<b>0.310</b>	<b>0.106</b>

**Chart 5.1/1  
REDUCTION OF LEAD IN FUGITIVE EMISSIONS**

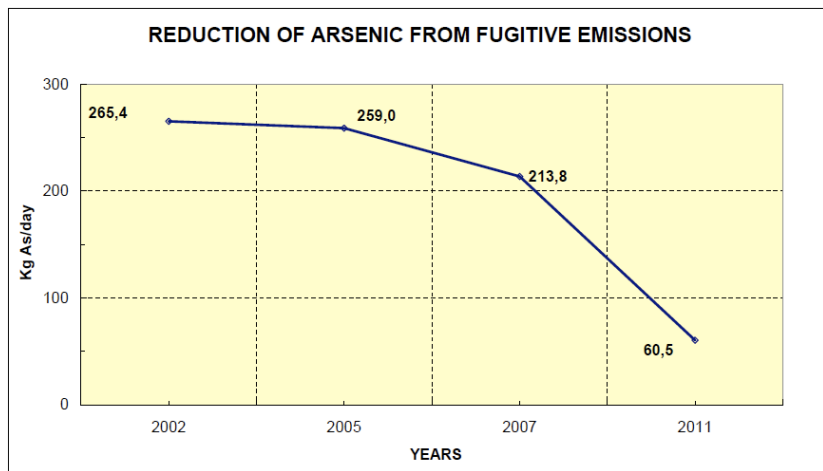


According to projections of the McVehil-Monnet model, the reduction of arsenic from current fugitive emissions of 259.0 kg/day, is projected to reach 213.8 kg/day by 2007, as a result of the implementation of the project involving the enclosure of the lead furnaces and foaming plant buildings, and the repowering of ventilation systems A, B, C and D of the sintering plant. This reduction will reach 60.5 kg/day by 2011, after the implementation of technological changes to the copper smelter. The projected reduction can be observed in table 5.1/2 and Chart 5.1/2.

**Table 5.1/2  
REDUCTION OF ARSENIC IN FUGITIVE EMISSIONS**

<b>ARSENIC Kg/DAY</b>	<b>2002</b>	<b>2005</b>	<b>2007</b>	<b>2011</b>
Scrubber from sintering plant	17,123	17,123	0.603	0.603
Sintering plant	4,438	4,438	0.740	0.740
Lead furnaces	9,479	6,301	1,589	1,589
Foaming plant	27,123	27,123	6,795	6,795
Anodic waste plant	1,589	1,589	1,589	0.159
Copper converters	38,082	38,082	38,082	9,507
Copper roasters	164,384	164,384	164,384	41,096
Zinc New Jersey roasters	3,151	0.000	0.000	0.000
<b>TOTAL</b>	<b>265,370</b>	<b>259,041</b>	<b>213,781</b>	<b>60,488</b>

**Chart 5.1/2  
REDUCTION OF ARSENIC IN FUGITIVE EMISSIONS**

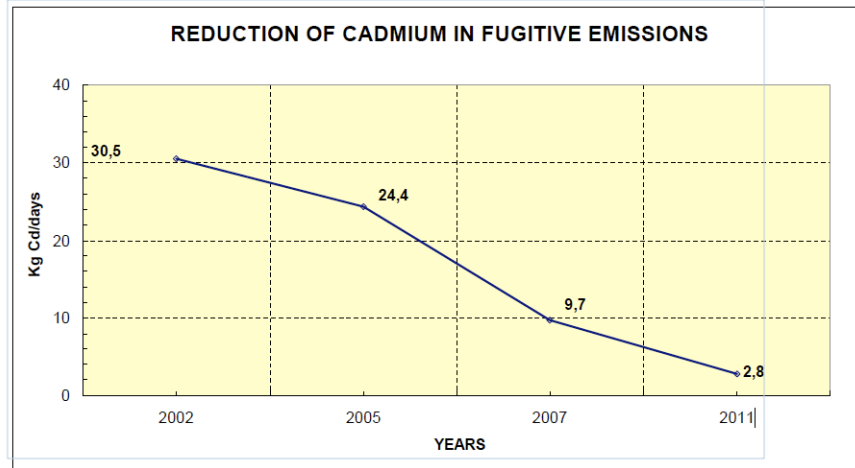


In the case of cadmium, according to projections of the McVehil-Monnet model, its reduction in fugitive emissions from their current level of 24.4 kg/day, is projected to reach 9.7 kg/day by 2007, due to the implementation of the project involving the enclosure of the lead furnaces and foaming plant buildings, and the repowering of ventilation systems A, B, C and D of the sintering plant. This reduction will reach 2.8 kg/day by 2011 after the implementation of technological changes to the copper smelter. The predicted reduction can be observed in table 5.1/3 and Chart 5.1/3.

**Table 5.1/3  
REDUCTION OF CADMIUM IN FUGITIVE EMISSIONS**

<b>CADMIUM Kg/DAY</b>	<b>2002</b>	<b>2005</b>	<b>2007</b>	<b>2009</b>
Scrubber from sintering plant	7,671	7,671	0.266	0.266
Sintering plant	2,027	2,027	0.329	0.329
Lead furnaces	10,274	6,849	1,726	1,726
Foaming plant	0.548	0.548	0.137	0.137
Anodic waste plant	0.137	0.137	0.137	0.014
Copper converters	0.548	0.548	0.548	0.137
Copper roasters	6,575	6,575	6,575	0.164
Zinc New Jersey roasters	2,740	0.000	0.000	0.000
<b>TOTAL</b>	<b>30,521</b>	<b>24,356</b>	<b>9,718</b>	<b>2,773</b>

**Chart 5.1/3  
REDUCTION OF CADMIUM IN FUGITIVE EMISSIONS**

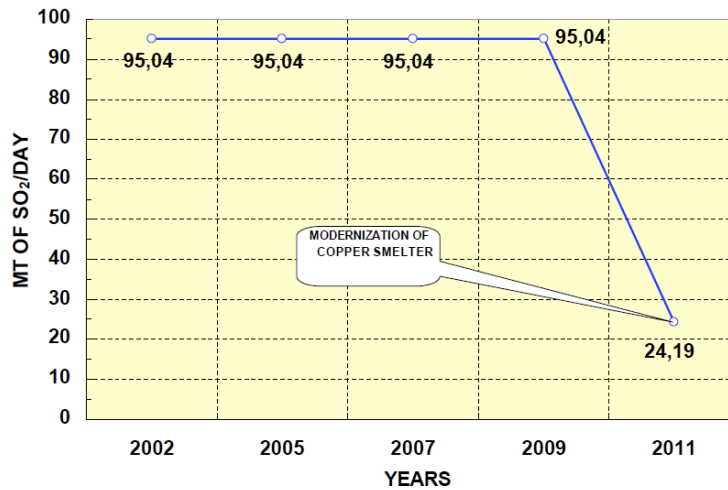


The emissions of sulfur dioxide through fugitive emissions, estimated at 95.04 MT/day, will maintain the same level until 2010, mainly owed to the emissions originating from the copper roaster, smelting and smelted copper conversion plants. With the implementation of the modernization project, emissions will be reduced to 24.19 MT/day. Said reduction can be observed in table 5.1/4 and Chart 5.1/4.

**Table 5.1/4  
REDUCTION OF SULFUR DIOXIDE IN FUGITIVE EMISSIONS**

<b>SO<sup>2</sup>, MT/DAY</b>	<b>2002</b>	<b>2005</b>	<b>2007</b>	<b>2009</b>	<b>2011</b>
<b>FUGITIVE EMISSIONS:</b>					
Building roof openings					
Copper roasters	34,560	34,560	34,560	34,560	8,813
Copper converter hallway	43,200	43,200	43,200	43,200	11,016
Reverberatory furnace	8,640	8,640	8,640	8,640	2,160
<b>Sub total</b>	<b>86,400</b>	<b>86,400</b>	<b>86,400</b>	<b>86,400</b>	<b>2,989</b>
Building fugitive emissions					
Copper roasters	3,110	3,110	3,110	3,110	0.793
Copper converter hallway	4,666	4,666	4,666	4,666	1,190
Reverberatory furnace	0.864	0.864	0.864	0.864	0.220
<b>Sub total</b>	<b>8,640</b>	<b>8,640</b>	<b>8,640</b>	<b>8,640</b>	<b>2,203</b>
<b>TOTAL FUGITIVE EMISSIONS</b>	<b>95,040</b>	<b>95,040</b>	<b>95,040</b>	<b>95,040</b>	<b>24,192</b>

**Chart 5.1/4  
REDUCTION OF SULFUR DIOXIDE IN FUGITIVE EMISSIONS**



## 5.2 REDUCTION OF DUST AND SULFUR DIOXIDE (SO<sub>2</sub>) EMISSIONS THROUGH THE CHIMNEY

Currently, process gases containing particulate matter are sent to the dust capturing system through electrostatic precipitators of Central Cottrell and Arsenic Cottrell, following the flow chart shown in the plan PRE-1-318-00-0-006, enclosed as Annex XI A. The table included therein shows that the annual average of current dust load flow, corresponding to 8 currents from the copper, lead and zinc circuits, and the anodic waste plant, moving towards the 21 units of the Central Cottrell, is 119.88 TM/day, which, after the recovery of 115.35 TM/day (96.22%), represents a chimney discharge of 4.53 TM/day (3.78%).

For 2007, after the implementation of four baghouse systems in the arsenic plant, anodic waste plant, lead furnaces and foam furnaces, and the subsequent repowering of the current sulfuric acid plant, as shown in the plan PRE-1-318-00-0-007 enclosed as Annex XI B, particulate matter emitted through the chimney shall be reduced to 3.33 TM/day.

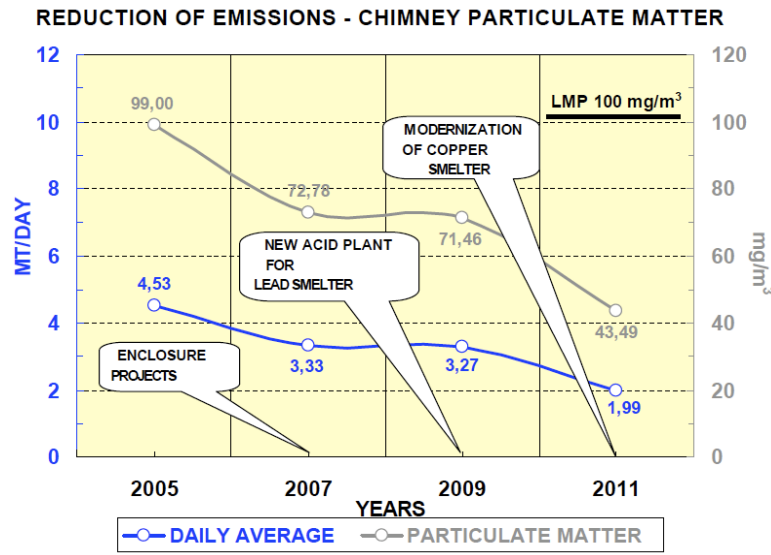
By 2009, after the implementation of the new lead sulfuric acid plant, as shown in the plan PRE-1-318-00-0-008 enclosed as Annex XI C, particulate matter emitted through the chimney will be reduced to 3.27 TM/day.

Finally, by 2011, after the installation of the new copper sulfuric acid plant, as shown in the plan PRE-1-318-00-0-009 enclosed as Annex XI D, the emission of particulate matter through the chimney shall only be 1.99 TM/day, corresponding to 43.49 mg/m<sup>3</sup>, a level far below the 100 mg/Nm<sup>3</sup> established as the maximum permissible limit (M.R. 315-96-EM) for particulate matter emissions.



The projected reductions are shown in Chart 5.2/1.

**Chart 5.2/1**



The reduction of chimney particulate matter emissions shall have a direct repercussion on the decrease of metal emissions, such as lead, arsenic and cadmium. The progressive reduction of these metals, as a result of the implementation of the aforementioned projects, is shown below.

For lead emissions, as shown in Chart 5.2/2, one can observe a reduction of 32.1 mg/Nm<sup>3</sup> in 2005, to 23.6 mg/Nm<sup>3</sup> in 2007, to 23.1 mg/Nm<sup>3</sup> in 2009, and finally to 14.1 mg/Nm<sup>3</sup> in 2011. Comparatively, a level lower than the maximum permissible limit shall be reached, that is, 25 mg/Nm<sup>3</sup> in 2007.

In the case of the presence of arsenic, Chart 5.2/3 shows a reduction of 15.3 mg/Nm<sup>3</sup> in 2004, to 11.2 mg/Nm<sup>3</sup> in 2007, and to 11.0 mg/Nm<sup>3</sup> in 2009, to finally reach 6.7 mg/Nm<sup>3</sup> in 2011. This level is lower than the maximum permissible limit of 25 mg/Nm<sup>3</sup>.

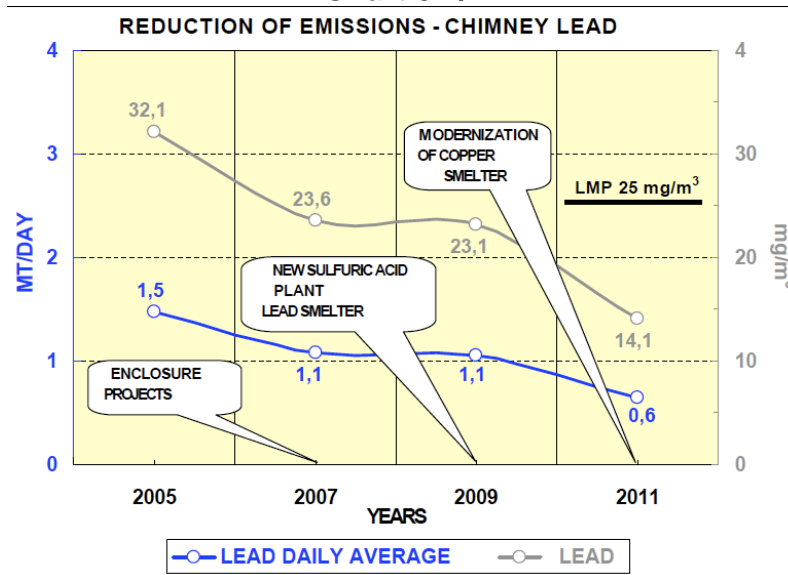
Concerning the emissions of cadmium through the chimney, these shall reduce to 1.04 mg/Nm<sup>3</sup> in 2005, to 0.76 mg/Nm<sup>3</sup> in 2007, to 0.76 mg/Nm<sup>3</sup> in 2009, and, finally, to 0.46 mg/Nm<sup>3</sup> in 2011 as observed in Chart 5.2/4. It must be noted that under current legislation, there is no maximum permissible limit for cadmium.

The current emission of SO<sub>2</sub> of 810.70 TM/day shall reduce to 789.68 TM/day in 2007, with the repowering of the current sulfuric acid plant. The start-up of operations for the new lead sulfuric acid plant will allow us to reach the 587.01 TM/day of SO<sub>2</sub> emissions by 2009, and with the copper technological change, in 2010, there will be SO<sub>2</sub> emissions of 513.83 TM/day, and for 2011, with the start-up of the new copper sulfuric acid plant, we shall reach the permissible level of SO<sub>2</sub>

emissions of 175 TM/day. The projected reduction can be observed in Chart 5.2/5.

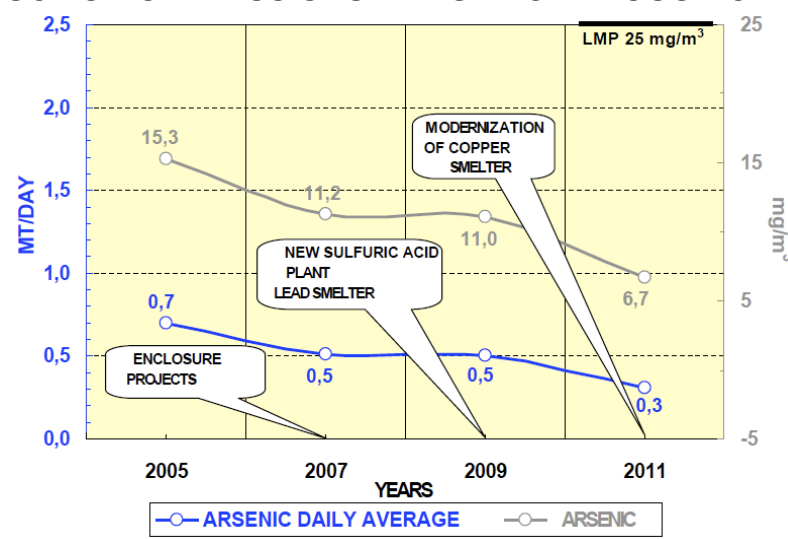
The various projects that comprise the PAMA of the metallurgical complex of La Oroya, and those included in the extension request, will enable us to reach the environmental goals expected by the company for the La Oroya population and communities located in the area of influence of the metallurgical complex. This proposal is not only based on a rigorous analysis from a technical, economic, social, and environmental standpoint, but it also complies with all requirements provided for in SD No. 046-2004-EM, mainly those referring to financial guarantees and trusts, which guarantee strict compliance thereto.

**Chart 5.2/2**

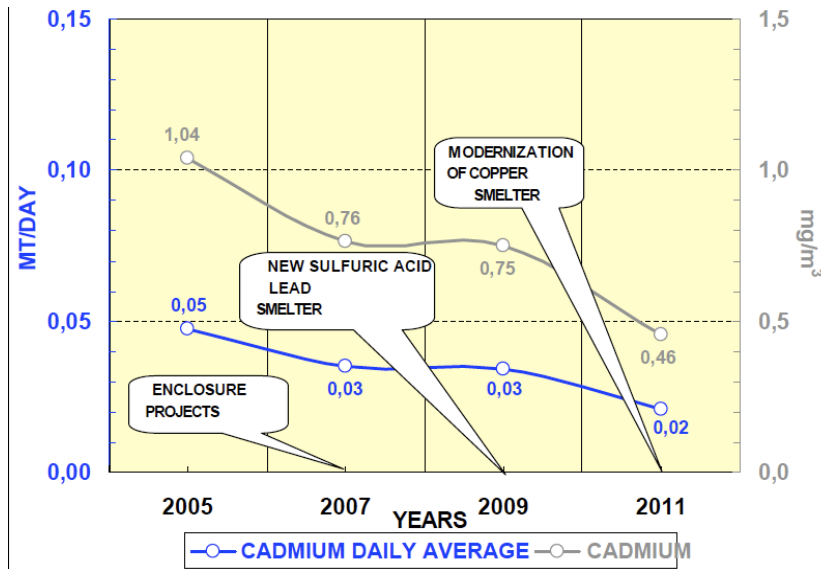


**Chart 5.2/3**

**REDUCTION OF EMISSIONS – ARSENIC THROUGH CHIMNEY**



**Chart 5.2/4**  
**REDUCTION OF EMISSIONS – CADMIUM THROUGH CHIMNEY**



**Chart 5.2/5**  
**REDUCTION OF EMISSIONS – SO<sub>2</sub> THROUGH CHIMNEY**

