



Critique of the May 2008 Blacksmith Institute report on La Oroya: *Site visit to the Doe Run Peru La Oroya Metallurgical Complex. Control of Process and Fugitive Emissions in the Plant and the Community*, Brian Wilson, International Lead Management Center.

In 2006 and 2007, the Blacksmith Institute named La Oroya one of the ten most polluted places in the world, a dubious distinction that reflects the gravity of the environmental contamination in La Oroya and its impacts on the health of the population. Following up on a site visit¹ to La Oroya, the Blacksmith Institute has now released a report that claims to be an objective and independent expert assessment of the environmental and human health situation in La Oroya. However, relying heavily on a single visit and meetings with the company, rather than on verified facts and a critical examination of the data, the report fails to note a variety of serious environmental concerns and the numerous improvements still needed to protect the health of citizens in La Oroya. By making unsubstantiated claims, the Blacksmith Institute is jeopardizing the efforts of Peruvian government authorities, as well as local, national, and international civil society organizations advocating for environmental and human health protection in La Oroya.

The team from the Blacksmith Institute's Technical Advisory Board apparently concluded that "the plans and programs implemented by [Doe Run Peru] and the Peruvian government were effective,"² yet the report does not provide the evidence necessary to substantiate this claim. Instead of providing an analysis based on data and including feedback from independent parties or local residents, the author appears to rely on Doe Run's own portrayal of the situation to describe the extent of the contamination and health impact in the city, progress on and justification for the Environmental Remediation Program (PAMA), and the effectiveness of planned investments. Moreover, the Blacksmith Institute fails to sufficiently

¹ Members of the Blacksmith Institute delegation to La Oroya included: Jack Caravanos, Ph.D., CIH, CSP, Director, MS/MPH program in Environmental and Occupational Health Sciences, Hunter College; Denny Dobbin, CIH, MSC-OH; Richard Fuller, Chair of the Board, Blacksmith Institute; Ian von Lindern Ph.D, CEO, Terra Graphics Environmental Engineering, Inc.; Brian Wilson, International Lead Management Center. The delegation traveled to Peru May 8 – 13, 2008 and newspaper articles cite the delegation as visiting the city of La Oroya on May 10.

² <http://www.blacksmithinstitute.org>.

analyze the public health situation, which is the issue of primary concern for La Oroya.

Environmental quality, compliance or the extent to which human health is being protected in La Oroya cannot be evaluated based on the company's level of *investment*, but should be assessed based on actual air quality data, blood-lead levels, and other environmental and health indicators that the report fails to consider. A key question that the report fails to address is whether the actions taken to date by Doe Run are sufficient to protect the environment and human health in La Oroya. Furthermore, the report fails to disclose a clear conflict of interest in that the author of the document is a staff member of the International Lead Management Center, which is linked to Doe Run and other companies in the lead mining and smelting industry. The following observations highlight some of our main concerns with the Blacksmith Institute report.

Observations:

Air Quality and Compliance with Environmental Standards:

The air in La Oroya is severely contaminated due to emissions from both fugitive and point sources at the metallurgical complex. While there is no doubt that with respect to some indicators, air quality is improved today compared to when the smelter was purchased by Doe Run in 1997, this fact does not mean that the programs implemented by the company have been "effective," or that planned improvements can be considered to be sufficient, as implied in the report. Toxic heavy metal and sulfur dioxide contamination from ongoing smelter operations continue to pose a serious health threat to the population, and will do so until much stricter measures are taken. It is difficult to understand how the report can suggest that protecting public health in La Oroya requires no action to reduce levels of lead and other contaminants beyond what is foreseen in the PAMA.

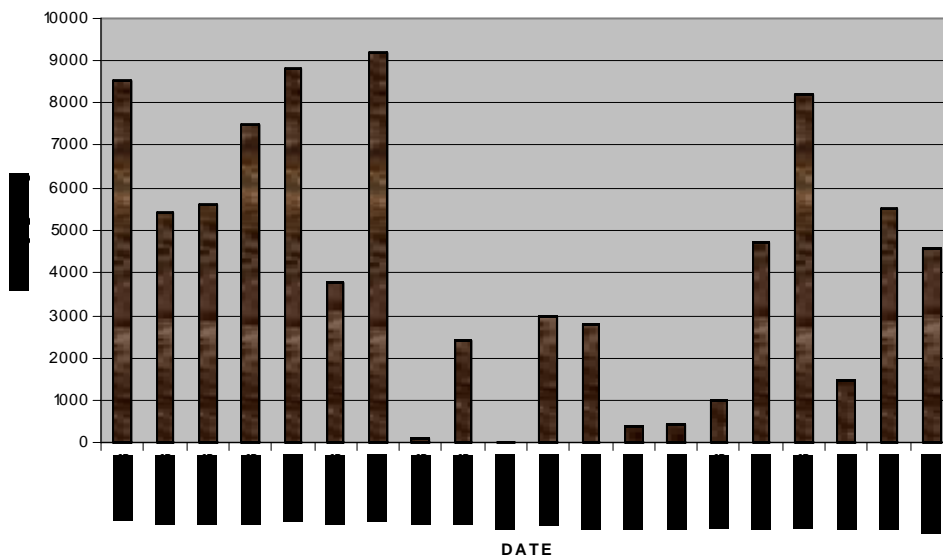
1. *The report presents no data indicating compliance with air quality standards to support the statement that programs have been "effective."* According to the most recent available government data, as of December of 2007 DRP did not yet comply with air quality parameters for lead and particulate matter that were obligatory as of December 2006.³ Timely compliance with these standards was a condition that DRP agreed to meet when negotiating for the right to

³ CONAM, 2008.

continue to drastically violate the SO₂ air quality standard until 2011.⁴ There is no question that current SO₂ contamination levels greatly exceed both Peruvian and international standards.

2. *The author relied on limited and questionable company data in evaluating the extent of environmental contamination in La Oroya.* As the graphs below illustrate, the contamination levels in La Oroya were remarkably and abnormally low on the dates surrounding the Blacksmith Institute visit to La Oroya. For example, the average daytime maximum peak for SO₂ was well above 5,000 ug/m³ in April, May, and June, not including the days of the visit. In stark contrast, the day of the delegation’s visit to La Oroya, contamination levels were zero for both SO₂ and PM₁₀.

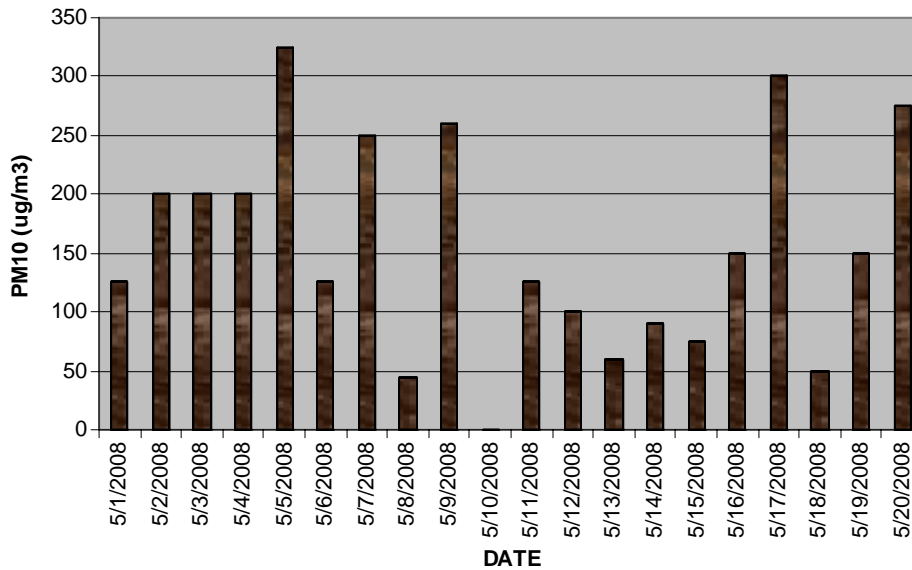
Daytime Peak Sulphur Dioxide (SO₂) Levels in La Oroya, Peru, May 1-20, 2008
Official Doe Run Measurements at Sindicato



Mean Daytime Peak of SO ₂ (ug/m ³) April; June	5570; 5012
Mean Daytime Peak (9am-5pm) SO ₂ (ug/m ³) May, not including days surrounding visit (May 8 – 13)	5639
Mean Daytime Peak of SO₂ (ug/m³) May 8-13	1457
Daytime Peak of SO₂ (ug/m³) May 10	0

⁴ MEM, 2006.

Daytime Peak Particulate Matter (PM10) in La Oroya, Peru, May 1-20, 2008
Official Doe Run Peru measurements at Sindicato



Mean Daytime Peak (9am-5pm) of PM ₁₀ (ug/m ³) May 1-7	203.57
Mean Daytime Peak of PM ₁₀ (ug/m ³) May 8-13	98.33
Mean Daytime Peak of PM ₁₀ (ug/m ³) May 14-20	155.71
Daytime Peak of PM₁₀ (ug/m³) May 10	0

3. *The report does not consider worst case scenario contamination levels.* In 2006, Doe Run’s monitoring stations were changed, so that the area that historically has had by far the worst air quality (“Huanchán”) is no longer being monitored. Thus, the monitoring stations currently operated by DRP do not depict the full extent of contamination in La Oroya, and can neither be used to assess compliance with environmental standards nor to indicate worst-case health risks. In fact, as the map below illustrates, only two of five current monitoring stations (“Hotel El Inca” and “Sindicato”) are located in close proximity to the smelter, while three stations (“Marcavalle,” “Huaynacancha” and “Huari”) fall outside of the five km radius that is generally considered to be the area of influence for lead particulate deposition.⁵

⁵ See van Alphen (1999). In a study of heavy metal deposition rates near a lead-zinc smelter in El Paso TX, lead deposition rates at distances of 1000m from the smelter were measured at 41% of those rates at 500 m, indicating

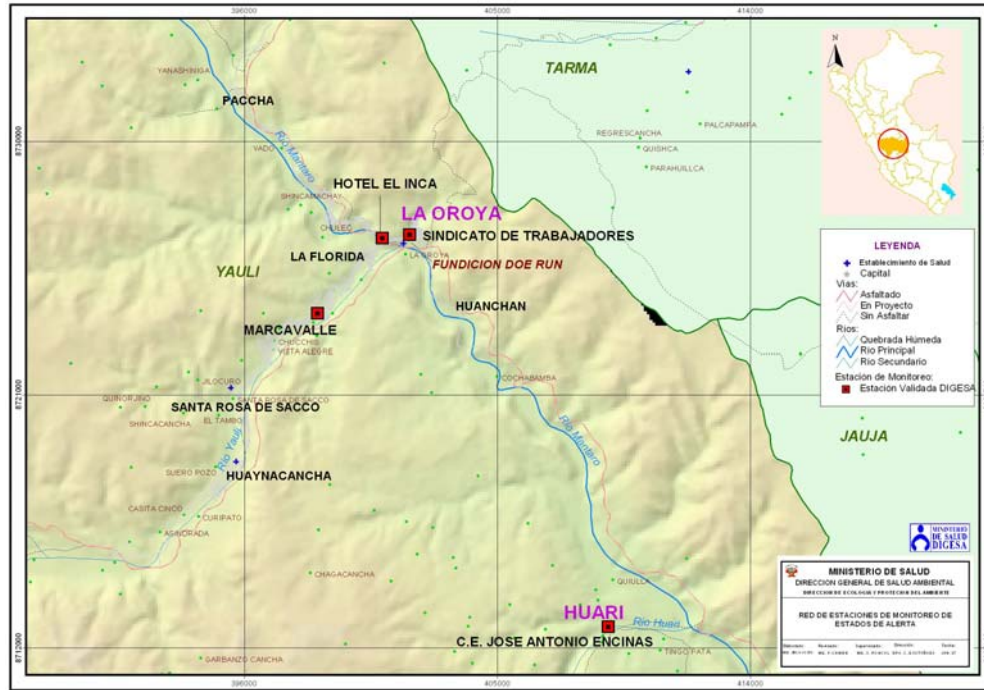


Figure 1: Environmental Monitoring Stations. The red squares show the location of the monitoring stations compared to the smelter in La Oroya.

4. *The report does not comment on the ambient lead, arsenic, or cadmium levels in the populated areas that are monitored and within the area of influence of the smelter.* Whereas real time monitoring data for SO₂ and total particulate levels at four monitoring stations is now available via the internet,⁶ there is no electronic access to current or recent monitoring data for the heavy metal contaminants of greatest concern in La Oroya, and thus no easy way for the public to determine whether or not air quality parameters with which the company must comply are being met.⁷ The report also failed to present this data as support for the conclusion that current plans and programs are effective.

5. *The report is based on statements made by DRP rather than actual evidence of progress.* The report's conclusion that Doe Run is meeting its environmental obligations is based on projects that have been *commissioned* but not yet completed (e.g., the Acid Plant, Copper

diminishing contamination with distance from the smelter. The contamination levels are drastically reduced beyond a 5 km radius.

⁶ Sindicato, Hotel Inca, Huari, and Marcavalle, <http://www.digesa.minsa.gob.pe/php/index.php?>.

⁷ In negotiating the most recent extension for implementation of the environmental management plan, DRP agreed to meet all air quality standards other than that for SO₂, by January of 2007.

IsaSmelt, etc.), and *supposed* outcomes (e.g., full compliance with SO₂ emissions by 2009), rather than concrete results. The author's apparent acceptance of the company's projections with respect to when compliance will occur ignores a history of failures to comply with environmental standards,⁸ and repeated requests by the company to change the nature of and deadlines for completion of PAMA projects.⁹ In light of this history, it is doubtful that the company's projections are accurate.

6. *The report failed to consider whether or not the projects planned but not yet implemented will be sufficient to protect public health in La Oroya.* There are many questions regarding whether or not the current PAMA will in fact protect public health in La Oroya. DRP's now sister company and former owner, Doe Run of Missouri, has significant experience with lead remediation and control technologies from operations at lead smelters based in Missouri, particularly the Herculaneum smelter, the largest single source of lead emissions in the United States.¹⁰ Doe Run helped design the current PAMA but apparently failed to consider lessons learned in the United States. For example, although the two smelters are subject to the same numeric air quality standard for lead, and although the Herculaneum smelter has frequently caused the surrounding area to be classified as non-attainment for that standard,¹¹ the proposed emission limits agreed to for the La Oroya site will be substantially greater than emissions reported in 2003 for the Herculaneum smelter. The proposed lead emissions (fugitive and stack combined) for La Oroya after completion of the PAMA will be **11 times greater** than emissions from the Herculaneum site. Arsenic emissions will be **1,245 times greater** than in Herculaneum, and cadmium emissions will be **19 times greater**.¹² It is astonishing that Doe Run Peru would consider these results acceptable goals, and that the Blacksmith Institute would agree with this assessment.

⁸ CONAM, 2008.

⁹ The original PAMA for the smelter was approved in 1996, with all obligations related to mitigation of current emissions being transferred to DRP upon purchase of the complex. DRP has since then negotiated and received approval for significant changes to the PAMA in October of 1999, April of 2001, January of 2002, and May of 2006. In fact, DRP was the only company in Peru to request and received approval for changes to its PAMA obligations.

¹⁰ According to the Toxics Release Inventory (TRI) compiled by the U.S. Environmental Protection Agency (EPA).

¹¹ Administrative Order of Consent in the matter of Doe Run Resources Corporation, Herculaneum Missouri, Docket # RCRA-7-2000-00-18, (2000).

¹² OK International, 2006. Comments on proposed modification of Doe Run PAMA.

7. *The report fails to consider international standards for lead in air.* The Peruvian air quality standard for lead is modeled on the 30-year old US standard rather than on the significantly stricter and more recent standard recommended by the World Health Organization. Recently, the US EPA has proposed substantially lowering the US standard for lead in air, on the ground that the current levels are known to be inadequate to protect human health.¹³ The Blacksmith Institute report fails to note that the Peruvian standard with which DRP aspires to comply is recognized to not be protective of human health.

Blood Lead Levels and Effectiveness of Intervention Programs

Blood lead level data is likely the most reliable and readily available indicator by which to assess whether the health threat from toxic heavy metal contamination in La Oroya is being reduced and to what extent current health programs are sufficient. The Blacksmith Institute report fails to consider or present any such data, yet seems to suggest that existing programs and planned projects adequately address the threats posed by heavy metal contamination in La Oroya. This position conflicts with that of the international health authorities and experts in childhood lead poisoning familiar with the situation in La Oroya and other similar sites,¹⁴ as well as with Peruvian government authorities working to protect public health in La Oroya.¹⁵

1. *In contrast to the position of foreign and international health authorities, the author seems to accept the position of DRP that only children with extreme levels of lead in blood are in need of intervention or assistance.* Only children under 6 years of age with blood-lead levels above 45 ug/dL attend the nursery in Casaracra, and of those, only those children with the highest blood-lead levels (above 70 ug/dL) receive specialized treatment in Lima.¹⁶ By contrast, the World Health Organization and many foreign governments consider that 10 ug/dL of lead in blood is the cut-off level for intervention. Although the report states that “several hundred young children” could benefit from programs similar to that offered at Casaracra, considering that more than 95% of children have blood lead levels exceeding 10 ug/dL, it is actually the vast majority of children in La Oroya that are in need of such care. It is startling that the Blacksmith

¹³ EPA. *Fact Sheet: Proposed Revisions to the National Ambient Air Quality Standards for Lead*, May 1, 2008.

¹⁴ CDC, 2005; Saint Louis University Medical School, 2005.

¹⁵ CONAM, 2007.

¹⁶ Convenio de Cooperacion MINSA/DIGESA-Doe Run Peru, 2006.

Institute would accept the extremely lax standard for protection of children's health promoted by DRP.

2. *The report endorses the Casaracra nursery program without making further recommendations regarding measures needed to protect children or public health in La Oroya.*

The Casaracra nursery program temporarily removes select children from La Oroya Antigua (the area with the highest levels of lead exposure) for 8 hours a day, five days a week. The temporary nature of the program and limited number of participants (100 of an estimated 5,000 children affected¹⁷) makes these efforts insufficient for dealing with a lead problem that affects *all* residents of La Oroya. The author has failed to consider that upon return to La Oroya or graduation from the program, these children are once again exposed to high levels of lead and thus readily recontaminated. Efforts to improve nutrition and hygiene (though helpful for those who benefit from the programs) do not address the principal source of lead contamination: the smelter's ongoing daily emissions. Without significant reduction of current lead emissions from the smelter and the remediation of soil and dust contamination accumulated over a long history of metallurgical activity, other forms of intervention will not effectively reduce children's lead levels.¹⁸

3. *The report presents no data to substantiate a claim of decreased blood lead levels among children in the city who do not attend the facility in Casaracra.* Although many children are now reportedly being tested regularly for lead in blood, the results of those studies are not public and it is not known whether the sample size is sufficient or the methodology appropriate to accurately discern trends in children's blood lead levels. Moreover, lead is only one of the heavy metal contaminants of concern for public health in La Oroya.

Remediation in La Oroya

The report discusses DRP's clean-up and home renovation programs in La Oroya Antigua as if these were sufficient and appropriate for dealing with the contamination problem and associated public health risks posed by the smelter. In doing so, the author ignores a long history of

¹⁷ Based on national averages, it is likely that approximately 30% of La Oroya's total population of 50,000 is under 15 years of age. Source: Population Reference Bureau. <http://www.prb.org/Countries/peru.aspx>

¹⁸ Center for Disease Control and Prevention, 2005.

lessons learned in smelting and mine communities, where it has been found that it is not safe or appropriate for human residences to be located near an active smelter. The report provides no examples of communities in which measures such as those described have been found to be protective of public health. Moreover, the report appears to endorse remediation programs of questionable efficacy given the ongoing nature of the contamination.

1. *The Blacksmith Institute report suggests that current company and government programs are sufficient to protect the health of the population, yet scientific studies have shown the “improbability that blood concentrations below 10 ug/dL will be achieved for all children in several mining and smelting communities, even with the most dramatic interventions.”*¹⁹ These studies recommend remediation on a community-wide basis rather than on an individual house basis. Given the experience of smelter towns around the world, relocation may represent the only permanent solution to the lead problems in La Oroya.²⁰

2. *The report seems to suggest that the problem of contamination in La Oroya is in great part due to legacy, as compared to active, contamination.* Although the smelter has been operational for nearly a century and thus has created a great deal of past contamination that must eventually be addressed, the critical levels of exposure to lead and other contaminants in La Oroya Antigua (the neighborhood located directly across the river from the metallurgical complex) are likely due primarily to the *current emissions from the smelter*. Doe Run and other mining sector companies often argue that problems related to heavy metal contamination stem mostly from re-suspension of historic contamination (contamination emitted in the past by the smelter). However, numerous case studies (in Trail, Canada; Port Pirie, Australia; El Paso, Texas; Macquarie, Australia, among others) have shown that it is the current operations of smelters and ongoing emissions that pose the greatest health risk, and that the health threat and blood lead levels decrease drastically and immediately when current emissions are curtailed, either temporarily or permanently.²¹ Thus, there is no reason to presume that the health problem in La Oroya stems from the historic contamination. Other factors mentioned in the report (that

¹⁹ Elias and Gulson, 2003.

²⁰ In both Torreon, Mexico, and Herculaneum, Missouri, the smelting companies bought the homes located closest to the smelter, so that contaminated homes could be destroyed and human settlements maintained at a safe distance from the smelters.

²¹ Elias and Gulson, 2003.

the “houses are the oldest in town,” lack of building regulations, poverty, etc.) compound the problems in this community, but should not undermine the need for a substantial and immediate reduction in smelter emissions or relocation of affected families. Until the current emissions are addressed, few other actions are likely to help resolve the problem.²²

3. *The report describes cleaning programs carried out in the city and at the complex to remove dust contaminated with toxic heavy metal particulates, but fails to present data showing the effectiveness of these.* The report states that mechanical and manual cleaning is carried out 24 hours per day, and that road sweepers minimize the amount of pollution-carrying dust. Yet this rigorous cleaning schedule and the use of mechanical sweepers only apply to the area *inside* the complex, and not to most populated areas in close proximity to it. In La Oroya’s residential neighborhoods, manual cleaning of streets, schools, and play areas is done by workers and local volunteers who are not always equipped with adequate safety gear. Wet cleaning risks transporting contaminants to other areas rather than removing them from the environment. Without studies to determine the effectiveness of these programs, it is unclear whether the frequency of street cleaning and methods used can effectively control the build-up of contaminants to prevent exposure to the population.

4. *The report mentions and appears to endorse an ongoing voluntary program funded by Doe Run to refurbish approximately 25 homes per year in La Oroya Antigua.* Not only will such a program take “many years,” as the author notes, but the effectiveness of refurbishing existing homes to reduce lead exposure is questionable given the proximity to the smelter. Refurbishing homes goes against Doe Run’s decision to relocate homes near its Herculeum smelter in Missouri, and is inconsistent with government proposals to permanently relocate La Oroya Antigua to a safe distance from the smelter.²³

Conclusions

The report published by the Blacksmith Institute is a summary of information presented by Doe Run Peru that fails to evaluate the accuracy of the company’s claims, ignores company and government monitoring data that demonstrates the lack of compliance with air quality standards,

²² CDC, 2005.

²³ CONAM, 2007, "Estudio de Factibilidad sobre la Reubicación de La Oroya Antigua" (Summary of the Feasibility Study Relocation of La Oroya Antigua).

and does not critically examine the current health situation in La Oroya. The report implies that Doe Run is acting responsibly and that no additional measures need to be taken beyond those already outlined in its PAMA, even though some of the PAMA commitments have not yet been met and, even if they were all met, would not adequately protect the people and particularly children of La Oroya. The report includes only one minimal recommendation for Doe Run (related to safe filling levels for railway wagons), and fails to analyze or discuss the relevance of the many recommendations outlined in previous studies and resolutions by other organizations and authorities.²⁴

Any report opining on the improvement of critical air emissions and other environmental parameters in La Oroya should be based not on a single pre-announced site visit and conjecture, but on publicly disclosed data, a review of relevant literature and studies, and consultation with not only the company, but also organizations and authorities with expertise in this matter. The omissions described above, as well as the lack of data to substantiate claims regarding emissions, air quality, and population exposure levels, present a misleading picture of the current health and environmental situation in La Oroya. The Blacksmith Institute report thus undermines efforts to actually achieve adequate remediation and clean-up in La Oroya.

²⁴ AIDA, 2003; CONAM 2007; CONAM, 2008; CDC, 2005; Constitutional Tribunal of Peru, 2006; Gesta Zonal, 2006; Interamerican Commission on Human Rights, 2007; Saint Louis University, 2005.

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