

How Stakeholder Engagement is Evolving at the Caldas Uranium Mining Site in Minas Gerais, Brazil – 13223

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ABSTRACT

The Caldas site is located in the Federal State of Minas Gerais in Brazil about 25km from the city of Poços de Caldas. While the city itself has 150,000 inhabitants there is a total population of around 0.5 million people living in an area that could potentially be influenced by the site. Uranium ore was mined and milled here between the years of 1982 and 1995, with ore extraction taking place from an open pit. Of the material removed, aside from that extracted for uranium, some was used on-site for road construction and building embankments while the remainder was disposed of onto two major rock piles. There are a number of potential historical and current environmental impacts to groundwater as a consequence of discharges into streams which then flow off site. The site is now undergoing a phase of decommissioning which includes the formulation and substantiation of a site remediation strategy.

As part of a wider International Atomic Energy Agency (IAEA) Technical Cooperation Project aimed at providing practical guidance for implementing a decommissioning and remediation plan at the site, WSP E&E were invited to lead a mission in order to provide advice on the importance and merits of stakeholder engagement and how to ultimately build an engagement program.

In November 2011, WSP E&E met with personnel from the site operators, the Brazilian regulatory bodies and representatives from the local stakeholder community and explained the principles of stakeholder engagement and how the process had internationally evolved principally from a decide-announce-defend approach to a more formal two way mechanism of engagement.

Historically there had been insufficient liaison between the site operator, the nuclear regulator and the environmental regulator. All parties had recognized that greater interaction was necessary. There had also been very little engagement with local stakeholders about the various activities on the site and the potential implications of these activities on human health and the environment.

The main concerns of the local stakeholders were in relation to potential environmental impacts on groundwater and surface water as well as their lack of knowledge about the site's activities and how it might evolve over time. There was a feeling that the site brought no real benefit to the local community as local labor was rarely utilized when work was being undertaken.

WSP E&E were asked many questions about stakeholder engagement processes and had to address a number of concerns relating to being able to construct and control an engagement program. Advice was provided on how to construct a phased program in a manner that would allow the site operator to demonstrate increased transparency and allow as wide a range of stakeholders as possible the opportunity to become engaged. We provided an important message in that engagement often had to be culture and project specific and that what might work in one country could not necessarily purely be transposed to another.

Since the WSP E&E mission there has been evidence of a number of positive steps in many of the areas of stakeholder engagement related to the Caldas site.

The nuclear and environmental regulators work in a more open and transparent manner and continue to undertake joint inspections of the Caldas site. They have agreed to develop a written agreement that will enable them to jointly assess and discuss the issues on the site. Both regulatory bodies had previously accompanied the site operator on a visit to the Wismut uranium mining area in Germany and as well as providing useful learning had also allowed the regulators to discuss some common issues, thus bringing them closer together.

A local stakeholder group under the auspices of the Water Commission had previously been set up but now they are starting to have more regular meetings with the site operator and nuclear regulator. They are now additionally considering the formation of a site specific advisory board (based on similar lines to those at US legacy sites) in order to gain some further technical focus within the stakeholder community.

The site operator has started to present and explain the proposed environmental remediation plans to various towns and cities potentially influenced by the Caldas site.

The successes to date can be attributed primarily to the willingness of the site operator to engage more openly with local community representatives in addition to the enthusiasm of the Water Commission itself. Providing stakeholder engagement advice to all the relevant parties in a manner which recognized their concerns, aspirations and country specific culture was extremely important for this positive progress to have been established.

The process established and the subsequent successes could provide useful learning to those countries that face similar cultural engagement challenges.

INTRODUCTION

The Caldas uranium mining site is located in the Federal State of Minas Gerais in Brazil about 25km from the city of Poços de Caldas (Fig 1). Uranium ore was mined and milled here from 1982 for thirteen years, with ore extraction taking place from an open pit (Fig 2). The uranium deposits were of low grade (675 – 1700ppm) and the uranium occurred mainly in the form of pitchblende. Uranium extraction itself occurred through sulfuric acid leaching.

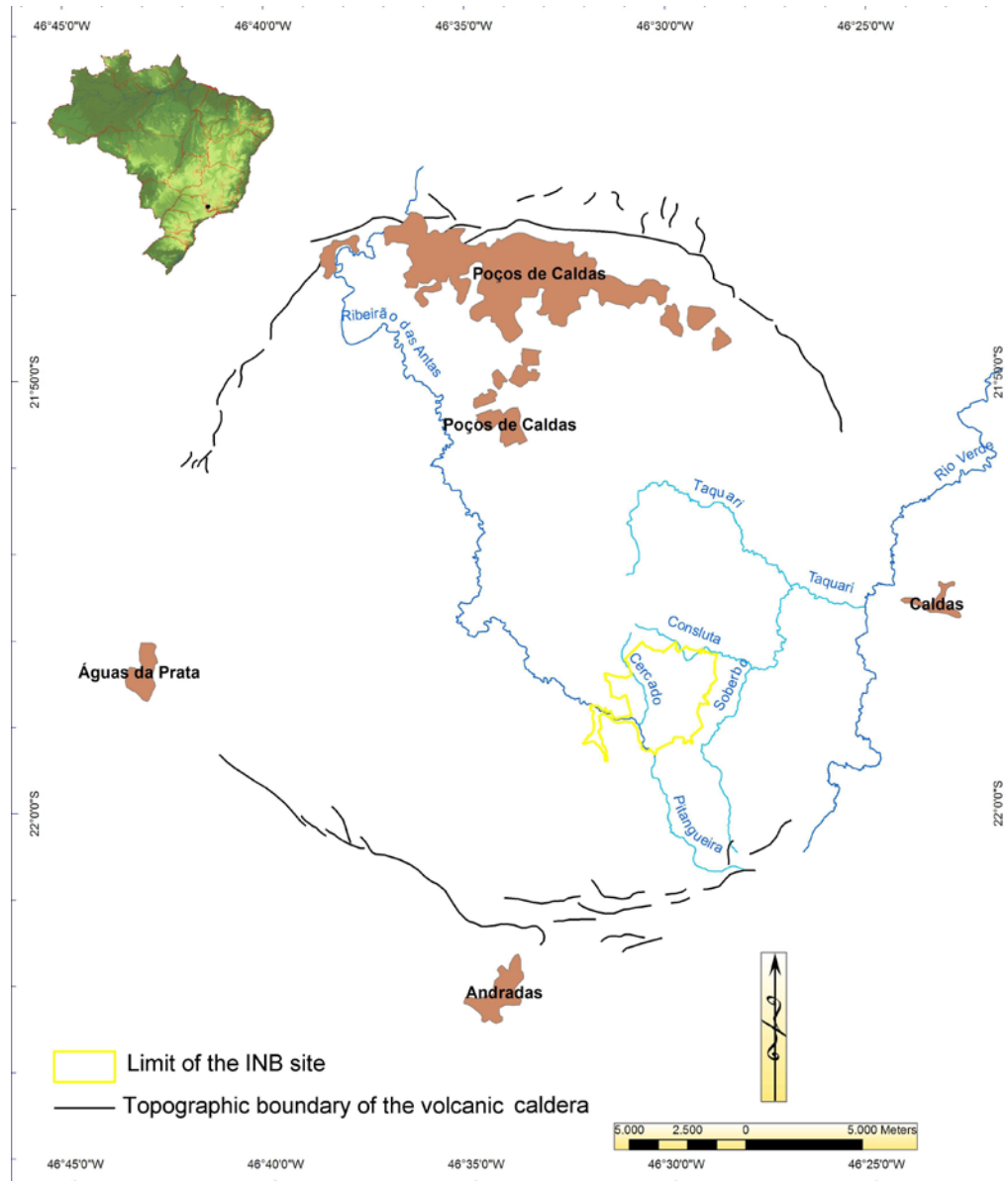


Figure 1 – Location of the Caldas Uranium Mine Site



Figure 2 – The Caldas Pit

Due to the local geological, hydrological and geo-chemical conditions, the relatively high annual precipitation rate (1750mm average annual precipitation) coupled with the high pyrite concentration in the waste rocks, significant amounts of acid mine drainage waters had (and still have) to be carefully managed. Presently, such acid drainage waters are collected in the mined out pit and pumped to a neutralization plant (Fig 3) before being discharged into a local stream. Historically, the water treatment residues (sludge's) were disposed of in the tailings ponds. However, more recently (10 years ago) due to the exhaustion of the disposal capacity in the tailings pond, the precipitates have been disposed of in the mined out pit. The effluent from the tailings dam is treated with $BaCl_2$ to remove radium from the solution. The precipitates are collected in two holding tanks and the overflow is discharged into streams.



Figure 3 – Water Neutralisation Plant

Of the material removed during the operation lifetime, aside from that extracted for uranium, some was used on-site for road construction and building embankments while the remainder was disposed of onto two major rock piles.

Very little remediation has been carried out in the past, and generally only in response to emergency situations. The processing facilities and other above ground structures are still standing, the waste rock pile surfaces are primarily still uncovered, and the open pit is also still in a state close to that following termination of mining operations. In a positive sense the site is now undergoing a phase of decommissioning which includes the formulation and substantiation of a site remediation strategy.

Taking all of this into consideration it is therefore not surprising that the main environmental impact of the Caldas mining site is likely to be caused through the water pathway. Talking to the regulators and local stakeholder groups it was learnt that there were a number of potential historical and current environmental impacts to groundwater as a consequence of the practice of discharging treated effluents and precipitated material into the streams which then flow off site.

Although the city itself has around 150,000 inhabitants there is a total population of around 0.5 million people living in an area that could potentially be influenced by any environmental and socio-economic impacts resulting from the site and its activities.

IAEA EXPERT MISSION

As part of a wider International Atomic Energy Agency (IAEA) Technical Cooperation Project aimed at providing practical guidance for implementing a decommissioning and remediation plan at the site (undertaken by Wismut GmbH), WSP E&E were invited to lead a mission in order to provide advice on the importance and merits of stakeholder engagement and how to ultimately build an engagement program.

In November 2011, WSP E&E met with personnel from the site operators (INB), the Brazilian regulatory bodies (CNEN and IBAMA) and representatives from the local stakeholder community. Discussions, coupled with a site visit, were held over six separate meetings.

Historically there had admittedly perhaps been insufficient liaison between the site operator, the nuclear regulator, and the environmental regulator. However, all parties had recognized that greater interaction was necessary. There had also been very little engagement with local stakeholders about the various activities on the site and the potential implications of these activities on human health and the environment. Increased interaction on both counts was encouraged during the mission.

The main concerns of the local stakeholders were in relation to potential environmental impacts on groundwater and surface water as well as their lack of knowledge about the site's activities and how the site might evolve over time. There was a feeling that the site brought no real benefit to the local community as local labor was rarely utilized when work was being undertaken. These concerns are not uncommon around uranium mining legacy sites irrespective of the country in which they were found.

Because the site operator was looking to improve the overall situation through the adoption of a decommissioning and environmental remediation plan it was stressed that this should be regarded as “good news” and that they should therefore not feel reluctant in communicating more to the local stakeholder community.

Having gained a greater understanding of the site and the associated stakeholder concerns it was then possible to carefully focus the advice provided to ensure it met the needs of the interested parties. The advisory program was therefore split into the following components;

- To introduce the principles of stakeholder engagement.
- To highlight the benefits and detriments associated with stakeholder engagement.
- To ask the question what might we want to communicate?

- To highlight the likely stakeholder issues of interest.
- To discuss the potential mechanisms for engagement.
- To explain how stakeholder engagement fits into the decision making process.
- How to plan a stakeholder engagement programme.
- To explain the role of the regulator in the engagement process.

A key point that was stressed was that engagement was nearly always culture and region specific and that what might work in one country could not necessarily be adopted elsewhere. Notwithstanding this point though, there were many generic learning points that were relevant and could be passed on. It was advised that in the first instance a phased program should be constructed which would allow the site operator to demonstrate increased transparency and allow as wide a range of stakeholders as possible the opportunity to become engaged. Understanding the stakeholders concerns, aspirations and logistical ability to engage was paramount before any engagement program could be formulated.

WSP E&E were asked many questions during the mission about stakeholder engagement processes and had to address a number of concerns relating to being able to construct and maintain ownership of an engagement program.

THE ENVIRONMENTAL REMEDIATION PROPOSED FOR THE SITE

If we look back at INB's Caldas history, when the site was opened over thirty years ago and mining activities began, Brazilian Environmental Legislation was not as restrictive as it is today. So in 2002 the site operator, the environmental and nuclear regulators and the Caldas City Hall, in a joint effort, signed an agreement committing to the development of an Environmental Remediation Plan - PRAD, which would be guided by a Reference Term written by the Environmental and Nuclear regulators (based on the assumption of a public dose increment of 1 mSv/year).

The goal of PRAD would be to produce specific solutions, in an integrated approach for the four main areas of interest: mine pit, waste rocks piles, tailings dam and the industrial area. As it was a very different kind of procurement for them, it took a few years until they managed to contract a consulting company that was technically and financially able to lead the project. The assessment was conducted between 2009 and 2012 and today PRAD's conceptual project is being assessed by the environmental and nuclear regulators, noting that the basic and executive projects are yet to be developed.

The ongoing process of acid drainage was identified as the greatest environmental issue and therefore the most relevant aspect of the mine decommissioning program. With that in mind, alternatives for eliminating or reducing water treatment were the ones considered. In addition, dose scenarios were assessed for the land's future use as a natural park and restricted access area (brown field).

Concerning the four main areas, total mine backfilling was identified as the best approach for the mine pit, waste rock piles and overburden materials, taking into consideration dose constraint, geotechnical stability, potential for acid drainage generation and a desire to return the site to as near as possible to its original landscape. As for the tailings dam remediation (Fig 4), both dry and wet in-situ solutions met the desired dose constraint requirements. However, the best approach will be defined upon an evaluation of the dam's long term mechanical stability. With respect to the industrial area, demolition and debris deposition into the mine pit were defined as the best strategy.



Figure 4 – The Tailings Dam

The project's total cost is estimated to be in the region of US\$ 250 million, but in order to move the project into the next steps of implementation, gaining the trust and approval of stakeholders was strongly recommended.

Today PRAD's conceptual project is being assessed by the environmental and nuclear regulators, noting that the basic and executive projects are yet to be developed. It is important to point out that all alternatives presented above would not be necessarily the one acceptable by those regulators.

SUBSEQUENT PROGRESS IN STAKEHOLDER ENGAGEMENT

Since the IAEA mission undertaken by WSP E&E there has been evidence of a number of positive steps in many of the areas of stakeholder engagement related to the Caldas site.

INB had engaged a remediation specialist contractor to consider a range of options for managing and remediating the site. It should be noted that at the time of the Expert Mission the results of this optioneering process (described above) were still unknown.

Although the nuclear and environmental regulators had clearly established working relationships, they have built upon this as they continue to undertake joint inspections of the Caldas site. They have agreed to develop a written agreement that will enable them to jointly assess and discuss the issues on the site. Both regulatory bodies and the site operator had previously visited the Wismut uranium mining area in Germany. This joint visit had provided useful learning on management and environmental remediation but had also allowed the regulators to see and discuss some common issues, thus bringing them to a closer relationship.

A local stakeholder group under the auspices of the Water Commission had previously been set up, encompassing several groups: nuclear regulator, local environmental department, local councilmen, water protection agency, water supply agency, NGO's and universities.

The Water Commission carried out an independent and comprehensive study on water quality within the Poços de Caldas Plateau and had its report released to the public, helping to increase public trust for the group. This report was also made available to national authorities, in an attempt to draw their attention to the importance of this environmental remediation project.

Bearing in mind that INB is a state owned company, one of the potential roles of this Commission would be to act politically to help ensure that there are enough resources for the project, as it is known that there is no guaranteed budget for its execution.

Additionally, the Water Commission is being considered to play the role of a potential site specific advisory board (based on similar lines to those at USDOE sites undergoing remediation), with the purpose of gaining further technical focus within the stakeholder community.

The site operator has started to present and explain the proposed environmental remediation plans to various towns and cities potentially influenced by the Caldas site. So far, presentations have taken place at the three most important towns: Poços de Caldas, Caldas and Andradas.

Many of the barriers to engagement have now been broken down. The progression and successes surrounding the increased engagement to date can be attributed primarily to the willingness of the site operator to engage more openly with local community representatives in addition to the enthusiasm of the Water Commission itself. Providing stakeholder engagement advice during the IAEA mission to all the relevant parties in a manner which recognized their concerns, aspirations and country specific culture was extremely important for this positive progress to have been established.

The process which WSP E&E established and the subsequent successes could provide useful learning points to those countries that face similar cultural and socio-economic engagement challenges.

CONCLUSIONS

From a point of virtually no engagement, (and even that on the lines more affiliated to decide-announce-defend) we are now seeing a healthier two-way communication process taking place. The IAEA mission undertaken by WSP E&E adopted an approach which ensured the understanding of the different concerns and aspirations of all the key players, not just the perceived stakeholders but importantly also those expected to undertake and drive the engagement. It is often forgotten that the latter have concerns of their own and that people often don't engage not because they don't wish to but because they are unsure how to.

This IAEA mission has demonstrated that although ideally engagement should be culture, geographic and even project specific, it is possible to take the generic aspects and successes of stakeholder engagement from one geographical area and adopt it in another.

This case study has demonstrated that with encouragement, guidance and through gaining an insight into international best practice it is possible for site operators to instigate and manage a genuine two way process of engagement.

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