The Evaluation of the King Rama VII Mining Museum in Mae Moh, Thailand
Interactive Qualifying Project

Sponsors:
Thamassat School of Public Health
in conjunction with
The Electricity Generating Authority of Thailand

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Abstract

The Electricity Generating Authority of Thailand (EGAT) operates a lignite mine and power plant in Mae Moh, Thailand. In the 1990s the environmental and health effects of EGAT’s operations caused them to reassess and improve their practices. As part of this effort EGAT built a museum to be an educational resource for the public regarding mining and EGAT’s emissions controlling initiatives.

Our project goals were to uncover the objectives of the museum and to determine if these objectives were being met. After our analysis, short-term improvements were suggested for the museum’s formal dedication ceremony by Princess Sirindhorn in June of 2007 as well as future long-term recommendations.
EXECUTIVE SUMMARY

The King Rama VII Mining Museum is located in Mae Moh, Thailand and is sponsored by the Electricity Generating Authority of Thailand (EGAT). By evaluating the King Rama VII Mining Museum, our group assessed the museum’s current operation and whether it is meeting the goals of the museum’s developers and EGAT officials. This information was used to provide feedback and ideas for improvement in the museum’s future. The museum has been very successful in winning the admiration of most visitors; our recommendations aim to help the museum be more successful in reaching its objectives, including honoring King Rama VII, informing the public about EGAT’s environmental improvements and serving as a resource for the community.

EGAT is Thailand’s major power producer, providing nearly sixty percent of Thailand’s total energy (EGAT, 2003). A major branch of EGAT’s operation is their mine and power generation facility in Mae Moh, Thailand. The power plant in Mae Moh provides about thirty percent of Thailand’s electricity. It is fueled by lignite extracted from the nearby mine, which is a dirty burning coal (Nuntavarn, 2007). In 1992 there was an environmental incident with acid rain and other pollution, which prompted EGAT to initiate an effort to address environmental impacts from its facility. Since 1992, the utility has installed scrubbers in the operational stacks at the Mae Moh power plant in order to meet the Thai government’s emissions standards. In addition to the implementation of scrubbers, EGAT has made efforts to reclaim the mining land for recreational use when the coal is exhausted. Even though these scrubbers vastly reduced the emissions from the plant and the land is being reclaimed, many people still have a
negative image of EGAT, the mine and power generation facility, and the quality of life in the Mae Moh region (Chooyos, 2007).

In order to mend community relations and repair their negative environmental image, EGAT has embarked on a series of initiatives designed to bring tourism to the area. One of the central elements of this plan was creating a mining museum in Mae Moh. The museum contains exhibits pertaining to King Rama VII, geology, mining processes, old coal mining machines, and environmental management techniques. In order to evaluate the museum, our group answered the following research questions:

- What are the objectives of the museum?
- Are the objectives being met?
- What can be done to improve the museum?

To determine the objectives of the museum we used formal interviews as our primary research tool; the interviews provided a forum where interviewees were encouraged to voice their personal opinions. Our group also used archival research in investigating the Terms of Reference, which describes why the museum was created. Through this research and formal interviews with EGAT officials and museum developers, we found that the objectives of the museum are to:

- honor King Rama VII
- create an understanding of EGAT’s mining and power generation operations
- bring tourism to Mae Moh
- dispel the effects of negative media attention
- inform visitors of the environmental improvements
- present reclamation plans to visitors
- be a resource for the Mae Moh community

To assess if the museum was meeting these objectives, we conducted formal interviews, focus groups, observational analysis, and distributed questionnaires. By
speaking to the visitors, we used the following criteria to determine if the museum is meeting its objectives:

- *Is the target audience of the museum actually attending the museum?*
- *Do the visitors’ opinions of EGAT and the Mae Moh mine change after visiting the museum?*
- *Do the visitors enjoy their visit? Would they return? Would they recommend friends and family to visit?*
- *Are there patterns regarding visitors’ favorite exhibits?*

We found that the King Rama VII Mining Museum was meeting its objectives in most cases. The museum was attracting the target audience it currently desired and changing visitors’ opinions of the area. Visitors all stated that they enjoyed their visits and would return. The responses regarding favorite exhibits, however, indicate that improvements can definitely be made in order to have visitors favorites better correspond with the objectives of the museum.

The final research question our group used in the evaluation of the King Rama VII Mining Museum was, ‘In what ways could the museum be improved?’ Our group posed this question to EGAT officials, museum developers, students, Mae Moh residents, and visitors. The EGAT officials were asked about any changes or additions they would like to see made to the museum. Students, Mae Moh residents, and visitors were asked similar questions in their respective focus group sessions to see what they viewed as potential areas for the museum’s improvement. The improvement ideas gathered in these focus groups and interviews pertained to additions to the King Rama VII Room, the museum’s accessibility, community involvement, the better flow of visitors on museum property, and the environmental management exhibits.

After reviewing the suggestions for improvement from interviewees and focus group participants, our team compiled recommendations that would address shortcomings
in these areas. Princess Sirindhorn of Thailand is going to dedicate the mining museum in June of 2007, so our suggestions were broken down into two categories, short-term and long-term improvements. Our short-term recommendations are:

- Improve the King Rama VII room by incorporating more artifacts
- Provide more information to go along with the sulfur dioxide exhibit
- Create an energy conservation exhibit, perhaps modeled off of EGAT’s Green Learning Rooms
- Incorporate Mae Moh history into the current community involvement exhibit
- Provide inexpensive items in the Souvenir Shop that can be used to illustrate the environmental progress in the region

Our long-term recommendations are to:

- Find an alternative to guided tours
- Balancing flow and utilizing property by incorporating outdoor exhibits and kiosks into tours
- Research the possibility of increasing the hours of operation
- Improve museum for return visitors by:
  - Creating new three-dimensional movies
  - Creating temporary exhibits
  - Bringing in special speakers
  - Holding periodic events
  - Developing a membership program
- Develop an English-language website to appeal to a wider audience

The short-term improvements should be implemented prior to the Princess’ visit. These improvements will help the museum to better meet its objectives and are both achievable in a short period of time and enhance important aspects of the museum’s objectives. The long-term suggestions are those that can wait until after the Princess’ visit and may need additional research and trials to determine what works best for the museum.

Although the recommendations provided cover a wide scope of the museum’s current operations, it is important to remember that the museum is currently successful in meeting the majority of its objectives. These recommendations will provide the public with more factual information regarding EGAT’s operations. EGAT has made great
strides in improving its environmental practices, and it is imperative that the museum
demonstrate the good works they have done. The energy the mine and power plant at
Mae Moh generate is an integral part of Northern Thais’ way of life and the entire
country’s industrialization. The museum must serve as a way to show the area’s
importance to visitors, while simultaneously displaying factual information relating to the
environmental and health effects of power generation.
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1. **INTRODUCTION**

The world’s movement towards modernization has brought social, environmental, and economic advancements and challenges. Third world countries pursuing development are driven by the need for energy to power societal advancements. Due to a lack of technology or resources, the types of power generation available to developing countries can have environmental drawbacks, like increased pollution. Although these resources can lead to possible health problems for citizens, they are less expensive, making them more feasible for poorer nations. This process of development has been a struggle for all industrializing nations around the globe, but because power is necessary for modernization, a balance must be found between the positive and negative effects of its generation.

Thailand is a newly developed nation that has gone through a rapid and arduous process of modernization. The Electricity Generating Authority of Thailand (EGAT) is Thailand’s major power producer, providing nearly 60% of Thailand’s energy (EGAT, 2003). EGAT is a state enterprise under the Ministry of Energy (EGAT, 2003). This relationship is meant to promote the development of energy production necessary for the country, while maintaining EGAT’s public responsibility to the people of Thailand.

A major branch of EGAT’s operation is their large lignite coal mine and power generation facility in Mae Moh, Thailand. Lignite mining can cause significant negative effects upon the environment and peoples’ health. In 1992, the sulfur dioxide levels in Mae Moh reached eight times the limit set in the United States due to an atmospheric inversion. This unique weather pattern caused power plant emissions to collect in the Mae Moh basin, resulting in damage to crops, some respiratory diseases among Lampang
residents, and sick livestock (Wangvipula, 2003). Before 1992, there was little
government regulation regarding the emissions from Mae Moh’s lignite mine and power
plant, which led to these negative environmental and health effects in the region. The
need for electricity and jobs made these hardships bearable in Northern Thailand, but
controversy still surrounds EGAT’s mine and power plant.

Since the early 1990’s, the utility has worked to reduce their emissions to meet
environmental standards and to rectify relations with the local people. EGAT currently
meets strict emissions standards set by the Thai government after installing highly
efficient scrubbers in the power plant’s stacks. EGAT also monitors the sulfur dioxide
emission levels through the use of eighteen monitoring stations within the plant and
various Lampang villages (Nosebleeds, 2000). Even though the installation of scrubbers
vastly reduced the pollution emitted from the plant, EGAT officials believe that the
people of Thailand still have a negative image of the EGAT power plant, mining facility,
and Mae Moh region (Chooyos, Interview, February 5, 2007).

In order to mend these relations, EGAT created a mining museum in Mae Moh,
called the King Rama VII Mining Museum. The museum contains exhibits pertaining to
King Rama VII, geology, mining processes, old mining machinery, and EGAT’s
environmental management techniques (Chooyos, Interview, February 5, 2007). The
museum has been operational for approximately a year, and has been seen by over 80,000
visitors.

Because the museum will be formally dedicated by Thailand’s Princess
Sirindhorn in June of 2007, EGAT officials and museum developers would like to
determine if the museum has been successful in reaching its objectives thus far. In order
to determine the museum’s current level of success, our project team compiled the objectives of the museum according to EGAT officials and museum developers. Through the use of archival research, formal interviews, focus groups, observational analysis, and questionnaires, our team determined if these objectives are being met and we provided short-term recommendations to improve the museum’s operation for its formal dedication. The long-term recommendations of this project will hopefully serve as a resource for future improvement plans and strategies for the museum.
2. BACKGROUND

The purpose of this background chapter is to present information that is pertinent to an evaluation of the King Rama VII Mining Museum. This chapter presents information regarding the Mae Moh region, the Electricity Generating Authority of Thailand, the King Rama VII Mining Museum, museum theory, and a comparative analysis of other museums.

2.1 MAE MOH REGION

The King Rama VII Mining Museum is located in Mae Moh, which is a district within the Lampang province in Northern Thailand, as is seen in Figure 1. Lampang has a population of 781,260 people (EGAT, 2003). The Mae Moh district, specifically, has a population of about 40,000 people (EGAT, 2003). The average resident makes the equivalent of $1,327 annually from wholesale and retail trade, mining, quarrying, and agriculture (EGAT, 2003). The main forms of agriculture in the region are rice fields, fruit orchards, flower gardens, cattle fields, and fisheries. The Mae Moh district is also a major source of lignite coal, which provides energy and capital for the region (EGAT 2003).

EGAT owns and operates a lignite mine and power plant in Mae Moh. Since the its establishment in the 1960’s, the mine and power plant have played a significant role in the society of Mae Moh by providing employment and energy to the area, but it has also brought about controversy regarding its environmental and health impacts, particularly after the atmospheric inversion and resulting pollution in 1992.
2.2 **THE ELECTRICITY GENERATING AUTHORITY OF THAILAND (EGAT)**

EGAT is the primary energy provider for the country of Thailand. The utility was established on May 1, 1969 when several power generation companies from around Thailand merged (EGAT, 2003). EGAT is a public enterprise that is monitored by the government (Nuntavarn, Interview, January 5, 2007). EGAT increases its range and customer base by collaborating with private companies (EGAT Public, 2006). The utility has locations all over Thailand and utilizes various forms of energy production including coal, wind, solar, and hydropower (EGAT, 2006). Currently, EGAT supplies power to over seventy-five provinces and produces 59% of Thailand’s total energy. EGAT is responsible for the operation of a grid system that spans the country of Thailand, as well as parts of Laos and Malaysia. As another source of revenue, EGAT mines and sells lignite (EGAT, 2003). They employ 27,600 people throughout Thailand and 4,300 of
those work at the Mae Moh facility (EGAT, 2003). EGAT’s lignite processing plant employs about 30% of their workers from Mae Moh (Nuntavarn, Interview, January 5, 2007).

2.3 **Environmental and Health Impacts Associated with EGAT’s Operations in Mae Moh**

In the fall of 1992, cool air from China blew into Southeast Asia forming an atmospheric inversion, which trapped sulfurous exhaust from the thirteen coal-burning stacks at EGAT’s Mae Moh power plant (Moore, 2000). These emissions combined with the immobile air and fog to form sulfuric acid. Over 1,200 villagers in the Mae Moh region were hospitalized for respiratory ailments caused by the poor air quality (Nosebleeds, 2000).

After this incident, the power plant in the Mae Moh region was recognized as a “pollution emitting source” by the government. Chulalongkorn University, stepped in to monitor the environmental impacts that the power plant was having on the region. The Ministry of Public Health, in conjunction with Chulalongkorn University, funded a five year in-depth study on the effects that the different air pollutants emitted from the plant have had on the Mae Moh region (College of Public Health, 2005).

2.4 **EGAT’s Relations with Mae Moh Residents**

Many villagers were skeptical of the improvements made at the plant because they were still suffering from respiratory diseases they believed to be caused from power
plant emissions. The head of the Thai Volunteer Service blamed the health issues of the residents on the dust and emissions from the mine. Between January and July of 2001, over 300 patients in the area had made 1,000 visits to local clinics for respiratory problems (Villagers, 2001).

Much of the controversy regarding EGAT Mae Moh has spurred from the relocation that has taken place in the area as a result of the mine’s expansion and pollution concerns. In 2001, a Bangkok Post article indicated that 3,000 people from the northern Mae Moh villages demanded relocation and compensation to avoid the health problems they felt that they were exposed to from living near the lignite mine and power plant (Nosebleeds, 2000). In 2004, 669 households were relocated because they were consistently subjected to the noise and air pollution from the mine and power plant.

Due to the pollution and relocation issues, villagers have had negative images of EGAT in the past and many of those feelings still linger as EGAT continues to improve and meet environmental regulations.

2.5 **EGAT’s Environmental Initiatives**

EGAT has taken responsibility for the environmental consequences that the power plant has had on Mae Moh. They have done this by lowering production, installing scrubbers, reclaiming mining land, limiting dust pollution, reusing byproducts, researching new methods of emission control, and working to rectify relations with the public.
Lowering Production

EGAT responded to the 1992 atmospheric inversion by reducing power generation by 50% during the October-March cool season. This was done in hopes of preventing another weather and pollution triggered disaster. Also, the power plant no longer operates the three oldest stacks. The power plant used to have thirteen operational stacks, but since the incident, EGAT only uses the ten newer stacks.

Installation of Scrubbers

The government mandated that EGAT reduce emissions by installing flue gas desulphurization (FGD) scrubbers into the power plant’s operational stacks. FGDs treat the gasses in the exhaust stacks, cutting airborne sulfur dioxide levels by as much as 95% (Nosebleeds, 2000). FGDs retain emissions so they are prevented from entering the atmosphere. To prevent the formation of nitrogen oxides, a lower combustion temperature is used, which precludes the fusion of oxygen and nitrogen atoms (Pitt & Millward, 1979). The ten operational stacks have all been installed with the FGD scrubbers and EGAT officials stated that they will never reopen the older three stacks unless FGD scrubbers are installed (Nosebleeds, 2000).

Reclaiming Mining Land

The Mae Moh lignite mine is being reclaimed. EGAT has a Thirty Year Plan for turning the mining pit into a recreation area for use by the local residents and visitors to the region. Some of the reclamations that have already been completed are a golf course, reforestation areas, and a flower exhibition hill.
**Limiting Dust Pollution**

In addition to installing the scrubbers in the stacks, EGAT has begun spraying water on the coal while it is in transit locations to limit dust pollution (Nosebleeds, 2000). EGAT also created a greenbelt in the southern portion of the village by planting tall trees to limit the dust and noise pollution from the mine (Nosebleeds, 2000).

**Reusing Byproducts**

Because coal is not considered a clean energy source, EGAT has investigated alternate uses for its byproducts. The fly ash from coal burning is useful in making concrete masonry blocks and some ceramic materials. Using the ash for masonry blocks saves an average of 15% on production costs when compared with normal production methods (Pitt & Millward, 1979).

**Fluidized Bed Units**

EGAT has also considered transitioning to Fluidized Bed (FB) units. The FB process removes sulfur dioxide during the burning process as limestone mixes with lignite. Limestone reacts with lignite to chemically convert sulfur dioxide into a harmless substance (Bangkok, 2000). FB units have not yet, however, been implemented at the power plant.

**Improving Relations**

Although EGAT has implemented these measures to reduce environmental damages, many Thais still view the Mae Moh facility negatively. EGAT is working to
improve relations with the residents and visitors to the Mae Moh region by informing them of the positive changes they have made, by drawing tourists to the region to see the changes for themselves. Some of their initiatives include an annual spring marathon, a winter flower festival, and, one of EGAT’s most ambitious initiatives, the creation of the King Rama VII Mining Museum (EGAT, 2003).

**Taking Environmental Awareness beyond the Power Plant**

EGAT has also taken their energy saving efforts beyond their initiatives at the power plant. In an effort to reduce the power demands from the public and teach about the need for conservation, EGAT has instituted a Demand Side Management (DSM) program. This type of program is designed to decrease the demand for power, rather than increase generation capabilities. EGAT created several programs designed to decrease consumer demand for energy by reducing the amount of energy used, including:

- *Energy Efficient Fluorescent Lamp Program*
- *Refrigerator and Air Conditioner Efficiency Labeling Program*
- *Commercial Building Retrofit Program*
- *High Efficiency Motor Program*
- *Energy Efficient Street Light Program*
- *Compact Fluorescent Lamp Program*
- *Cool Storage Program*

As of 1998, these programs resulted in 270 MW of peak load demand savings and 1,500 Gwh of energy savings. (Sitthiporn, 1998).

EGAT has also created the Green Learning Room program to help teach schoolchildren about the importance of energy conservation. Currently, 370 schools across Thailand have taken part in this instruction in good environmental behavior (EGAT, 2003). It has been shown that those children who take part in this program
demonstrate a higher degree of energy saving knowledge, as well as a higher degree of energy saving practices (Daoruang, 1998).

2.6 **King Rama VII Mining Museum, Mae Moh, Thailand**

Another way that EGAT is seeking to teach people about mining and power generation and their environmental initiatives is through the King Rama VII Mining Museum. This 700 square meter building was conceived in 2004 and has been operational for over a year now and has had about 80,000 visitors. The museum currently has exhibits regarding King Rama VII, geological information, mining and power generation processes, old machinery, and information on EGAT’s environmental initiatives. The museum is scheduled to be officially dedicated by Princess Sirindhorn in June of 2007 (Chooyos, Interview, February 5, 2007).

The museum was partly created to honor King Prajadhipok, also known as King Rama VII, the son of King Rama V and brother to King Rama VI. He held the throne as the King of Thailand from 1925 to 1935. He was the first King of Thailand to move towards a democratic government (EGAT, 2003). The reason that he is honored by the museum is because during his reign, he made a royal decree to reserve the lignite resources, over 1.4 billion tons, in the Mae Moh basin for government use. The country of Thailand has benefited greatly from his decree and the museum seeks to commemorate his work (EGAT, 2003).
2.7 **MUSEUM OBJECTIVES**

The King Rama VII Mining Museum shares many of the basic goals of other museums around the world, as will be identified later in this report. Museums typically focus on public education, community involvement, and development and retention of their target audience (AAM, 2006). All of these goals must be considered when evaluating the mining museum in order to effectively analyze its strengths and weaknesses. In this section we will present the primary purposes of a museum and specifically relate them to the mining museum.

### 2.7.1 Providing an Educational Resource

The past fifty years have seen a shift in the primary focus of museums; museums are no longer simply places to collect dusty historic documents and artifacts. Instead of viewing guests as a passive group, museums have begun to understand that visitors typically wish to be engaged in active learning (Hooper-Greenhill, 1999). In order to provide this type of environment, it is important to understand how people learn (Black, 2005).

**Didactic Learning**

Traditional museum exhibits can be described as didactic; a curator or other member of the museum’s staff is charged with lecturing visitors. This is a passive method based on traditional teaching methods seen in higher education and is way to deliver a significant amount of knowledge to a large number of people (Black, 2005).
Although didactic learning is prevalent in some educational settings, challenges arise when this method is translated to museums. Unless patrons visit the museum frequently, it is difficult for them to retain information presented didactically (Black, 2005). In order to increase the level of learning, many museums are moving to a more experiential learning method (Black, 2005). Through an interactive approach, museums are more likely to create a memorable experience where visitors are more likely to remember the presented material (Black, 2005).

**Interactive Learning**

Over one hundred years ago the Smithsonian National Air and Space Museum recognized the need to create outreach programs for children by incorporating active learning by emphasizing participation (Skramstad, 1999). Children tend to prefer hands-on exhibits, and place a great deal of value on an entertaining, relaxed atmosphere (Black, 2005). Active learning, relies on increased involvement, and allows for improved retention of information, and generally provides a higher level of visitor satisfaction (Black, 2005).

For example, ‘Heats up, shield up’ at the Smithsonian is a program where students learn about conduction, convection and radiation. They investigate the usefulness of heat shields while in space and have the opportunity to make and test their own heat shield (Smithsonian, 2006). In the ‘Paper Airplane Design’ tutorial, the science of airplanes is explained. The museum staff members teach students how to make and test their own paper airplanes and they use experimental design and data collection to create the optimal airplane. Another interactive exhibit that the museum features is
‘Seeing the World through Satellites’ Eyes’ where children simulate satellite moon orbits and they get to make their own satellite (Smithsonian, 2006). The Smithsonian National Air and Space Museum presents scientific material in a form that is intriguing to their target audience. This is important for museums, such as the King Rama VII Mining Museum, which are looking to entertain and educate school students.

**Building Relationships with Schools**

An important way for a museum to provide an educational focus is through their involvement with schools. Museums have the ability to provide educational experiences for school children, and student audiences are becoming more and more a part of most museums’ focus (Black, 2005). Museums that wish to increase the educational value of their exhibits must take into consideration how their programs can tie into the curriculum of local schools.

Although museums and traditional classrooms are educational settings, the information transmitted in them is presented quite differently. Classrooms typically present information sequentially, while museums are less structured and allow the patrons’ own interests to guide the visit. By developing a collaborative program between a museum and school, the advantages of both styles can be gained (Berry, 1998). Along with providing a valuable educational experience, a school trip to a museum also has the potential to create life-long museum visitors (Black, 2005). By creating future lifelong visitors, structured educational visits to museums are one of the best ways to increase community involvement and visits to the museum.
**Education Relating to Controversial Matters**

Museums can also be used to educate visitors about controversial matters. A museum provides a venue for the presentation of controversial material in an objective manner, which allows visitors to draw their own conclusions about the issue in question (AAM, 2006). Like the museum in Mae Moh, the Nippon Mining Museum located in Ibaraki, Japan is owned and operated by the company that mined the region. Its developers faced the same challenges regarding the best way to balance the promotion of the corporation with historical accuracy. The museum has several exhibits located in a central exhibition hall, as well as a separate hall that focuses entirely on mining technology. The main exhibition hall contains displays on the region’s history, the utility, and the measures taken to reduce pollution in the area (Nippon Mining Holdings, Inc., 2006). These displays also may be appropriate within the King Rama VII museum because they display historical facts and allow visitors to draw their own conclusions on the utility and its practices.

2.7.2 **Community Involvement**

Museums often seek to be a community resource by providing services particularly needed in the communities in which they are located. This can be done by making a museum accessible and by incorporating the community’s history and people into the museum. Museums have the ability to serve as a cultural center for the community and help preserve the heritage of an area (Abroise, 1993). Museums are widely known as a gathering place for families and friends.
Museum Accessibility

In order to become a community center, museums must encourage community involvement rather than only visits to see exhibits. Museums need to be accessible to their visitors and there are many ways to accomplish this goal, depending on their target audience. If the museum is financially stable, then they may offer free admission to visitors, inspiring those who are skeptical about the quality of the museum to visit without fear of wasting their money (AAM, 2006). In order to attract the younger members of the population, museums can offer field trip programs to interest grade school children. To provide information about educational techniques to teachers, museums can provide informative handouts or professional development seminars. Programs can also be established where museum curators and experts can bring traveling exhibits to schools, camps, or town events. Evening events and workshops can be held to make the building a place were they would like to return (AAM, 2006).

For example, the Loveland Museum and Gallery in Loveland, Colorado provides an outreach program to local schools (Outreach, 2004). Through the help of local volunteers and museum staff, it has created the ‘Wholesome Folsom Artifacts Roadshow’ and presents it to many third and fourth grade classes. This program began operating in 2002 and offers children hands-on opportunities to touch and learn about mammoth fossils and Native American artifacts. The students are given the chance to ask questions to the presenter (Outreach, 2004). This outreach initiative presents the museum to students and teachers in the area and it shows that the museum is seeking to enrich the lives of those in the community. Both education and community involvement do not just
offer advantages for patrons; they offer significant enhancement in membership recruitment and retention and offer incentives for attendance.

**Incorporating Community Information**

In order to draw community members into the museum, museums must provide information of interest to the local population. One way to do this is to incorporate information about the community into the museum’s exhibits. Even a museum that is focused primarily on a subject such as mining can increase their audience by informing visitors about the surrounding community. For example, the Kentucky Coal Mining Museum focuses primarily on the mining industry and its impact on the area, but it also presents information on the region as a whole. It contains exhibits including a mock mine, displays the process of coal mining, and gives a history of the area. It also includes an exhibit on Loretta Lynn, a local resident who went on to become a famous singer, and a rotating exhibit that displays the culture of the area (Shearer, 2006).

**2.7.3 Audience Development and Retention**

Audience sustainability is of primary concern to smaller, regional museums. Because the majority of visitors to these museums are local, regional museums run the risk of having everyone that cares to visit the museum do so in the first three to five years of operation (Black, 2005). These museums need to provide incentives for visitors to come back. Repeat and regular visitors have special demands that must be met in order to ensure the continuing success of the museum. Repeat visitors are visitors who have
been to the site before, but come back infrequently to see new facilities and special exhibits (Black, 2005).

**Increasing Museum Attendance**

One way to increase museum attendance is to transform repeat visitors to regular visitors who will visit the museum more frequently and become more involved in additional programming and activities (Black, 2005). Regular visitors typically enjoy visiting museums as a leisure activity and view visits as a pleasant experience. Regular visitors can be drawn in by frequently changing exhibits and events, and providing them with an opportunity to contribute to the museum. Active involvement, such as meeting with museum staff, becoming a member of the museum, or social events are some of the best ways to create regular visitors (Black, 2005).

**Developing New Audiences**

Along with increasing the frequency of regular visitors, it is important for museums to develop new audiences. Even if a museum has a strong base of regular visitors, the expansion of its audience will allow for an even greater impact in the community (Black, 2005). If a museum grows too dependent on its current audience, it faces the risk of reduced membership and little possibility for growth. By appealing to members of the community that have not typically shown interest in the museum, a museum has a much greater potential for expansion.

One of the most important factors to audience development and retention is ensuring that the museum is accessible to visitors ranging in age, income level,
educational background, and availability. To do this, museums should conduct an analysis of their public image. They should gain an increased understanding of what has kept people away previously. The key barriers to visiting a museum are feeling that the museum is irrelevant to one’s life, a lack of time, a lack of awareness, a lack of specific facilities, poor physical access to the site, a sense of exclusion due to a limited educational background, and costs of entry (Black, 2005). If a museum desires to grow and increase the diversity of its visitors, they must consider these factors and determine ways that they can inspire new people to come.

**Museum Memberships**

Museum memberships are incentives for visitors to become more involved with a museum and to visit more frequently. One museum that offers extensive programming and incentives for members in order to sustain and develop membership is the Worcester Art Museum (WAM) in Worcester, Massachusetts. One of the strongest characteristics of the WAM is its educational programming. It offers yearlong courses in art and history, and has devoted a complete wing to education, containing eight studios, two classrooms, a photography lab, and an exhibition space (WAM, 2006). The educational programming, for both adults and children, includes art of several mediums such as oil paint, acrylics, and clay.

Other methods that are used include employing patrons to recruit members and solicit donations. The WAM invites students and patrons who frequent the museum to make membership phone calls and offer incentives to both the callers and patrons who renew their memberships. These methods are widely accepted in the museum.
communities because of their effect on the client museum relationship. By understanding and believing in the ideals of the museums, by finding a common goal, patrons are more likely to keep returning (Glynn, 2004).

2.8 **THAILAND MUSEUMS**

It was important to gather data from other museums in Thailand because the museum developers and EGAT officials are attempting to reach their target audiences in similar cultural surroundings. The King Prajadhipok Museum, the National Museum, and the Hall of Opium Museum were three museums that our group visited to gain a better understanding of how museums operate in Thailand. We sought to discover the methods they use for audience development, advertising, and exhibit design to aid in the evaluation and recommendations for the King Rama VII Mining Museum.

2.8.1 **The King Prajadhipok Museum, Bangkok, Thailand**

The King Prajadhipok Museum works to fulfill the key goals of a museum, such as being an educational resource, promoting community involvement, and working towards further audience development and retention. The King Prajadhipok’s Institute is a national academic institution that sponsors the museum. The organization is committed to ‘the development of democracy to achieve sustainable peace.’

The King Prajadhipok Museum in Bangkok presents information on the life and efforts of King Prajadhipok, also known as King Rama VII. One of the primary reasons for investigating this museum was to see how the information about King Rama VII was
displayed. The museum contains a timeline of his life, including several photos from his youth, monkhood, marriage, and from his travels as King. Quotations from diplomats are scattered throughout the exhibit halls stating the good works of King Prajadhipok.

The museum consists mainly of permanent exhibits, but there is an exhibition hall on the first floor, which rotates exhibits twice a year. The museum is also part of a museum loan system, so their artifacts and information are often traveling to other museums, like the King Rama VII Mining Museum. The information in the museum is presented in Thai and English to reach a wider audience.

The building in which the museum is housed served as the Bangkok’s Office of Public Works for sixty-two years and has been home to the museum for five years. During the museum’s operation, they have seen about 21,000 visitors annually (Weeranuj, Interview, January 19, 2007). The museum receives 70% of their funding from the government and the other 30% is made through fundraising, ticket sales, membership fees, and gift shop sales. The museum’s tactics are important to analyze and compare to the methods used in the King Rama VII Mining Museum in Mae Moh.

The King Prajadhipok Museum targets all ages, but primarily works to bring in students, both grade and university levels. To target children specifically, the museum arranges special days where children can come to the museum with their parents to participate in games and scavenger hunts. The museum also welcomes foreigners, attracting several hundred each year, 911 in 2005 and 451 in 2006 (Weeranuj, Interview, January 19, 2007).

The museum has one permanently hired public relations organizer who advertises through the use of newspapers, radio, and television. The publicity is directed to
provinces all over Thailand. To handle speakers and discussions, the institute hires external public relations assistance. One of the biggest means of bringing in visitors is through their membership program. To be a lifetime member of the museum, there is a fee of 500 baht, and 100 baht fee for annual membership. The members of the museum are sent a monthly newsletter and they are kept up-to-date with the events of the museum. Their encouragement for their friends to join has allowed the museum to expand (Weeranuj, Interview, January 19, 2007).

From visiting the King Prajadhipok Museum, our group gathered the following effective museum strategies:

- **Presenting in both Thai and English text**
- **Utilizing traveling and rotating exhibits**
- **Catering to children through interactive programming**
- **Having an active public relations program**
- **Using museum membership programs**

### 2.8.2 National Museum of Thailand, Bangkok, Thailand

The National Museum of Thailand is one of several National Museums around the country. We visited this museum to see how a larger museum in Thailand operates. The Bangkok location is the largest National Museum in Thailand and sees around 300,000 visitors a year.

The museum has an informal membership program; it is free to join, and members are added to a newsletter that provides information on upcoming events, temporary exhibits, and new acquisitions. The museum is converting the membership program to a more Western method, in which members pay money to join and receive even more benefits. Members often become part of the museum’s international volunteer program.
The volunteer program is very active, and provides tours, lectures and excursions to historical sites in multiple languages.

Although 300,000 annual visitors is a large number, the museum is attempting to draw in even more. The museum was designed to bring in 600,000 people per year. The museum’s target audience is students who generally visit as part of school groups or the museum sends traveling exhibits to schools accompanied by curators or other staff members.

The museum draws a large percentage of its visitors when temporary exhibits arrive. Along with the rest of the National Museums of Thailand, the museum has partnerships with other institutions around the world. The museum has worked with Japanese, Mexican, American, French, and Korean institutions, and exhibits brought in from these partner institutions provide new experiences for museum visitors. These new exhibits are also a good way to draw return visitors.

The museum is operated by the Fine Arts Department of the Thai government, and this is the source of the majority of their funding. They also have income from ticket sales and private donations. Their budget is limited, so their advertisements are typically small, with little reliance on television or print ads. They submit articles to local newspapers and set up displays in shopping centers and on the street near the museum. The museum also owns a ‘mobile museum,’ a vehicle that contains small exhibits, which is driven to public events to provide publicity.

From visiting the National Museum in Bangkok, our group learned about the practices of larger museums and we were able to gather relevant information for the
evaluation and potential improvement concepts for the King Rama VII Mining Museum. These practices include:

- Using a museum membership program to publicize
- Presenting the museum material in several languages
- Having temporary exhibits to draw visitors
- Utilizing traveling exhibits to visit schools

2.8.3. The Hall of Opium Museum, Chiang Saen, Thailand

The Hall of Opium is located in the ‘Golden Triangle’, the region where the Thai, Myanmar, and Laos borders intersect. This area was known for its production of the type of poppy used to make opium. The Thai government sponsored the creation of the museum following decades of opium reduction campaigns. The museum presents the history of opium, the effects of the opium trade on Thailand and other nations, and the effects of opium on individual users. The museum was designed by the same person that designed the King Rama VII Mining Museum. Our group visited this museum to see how the museum creator presented material on a controversial issue at the site where the events took place; much like the mining museum being at the site of the lignite mine is seeking to do.

The museum’s exhibits bring the controversial issues to life through the use of rich historical information and detailed explanations of what has happened to the lives of the people living in Northern Thailand as a result of the drug trade. Historical information is presented in themed rooms decorated in the style of the period. Each room is full of artifacts and textual explanations, and many rooms use automated moving models to draw visitors into the presentation. Other exhibits contain dioramas that simulate important events and locations. The museum also relies heavily on video
presentations, many of which contain dialogues with drug users and opium growers. These personal accounts brought more to the presentations and allowed visitors to connect with the history to gain a better understanding of the impact that opium production has had on the Thai people.

The Hall of Opium Museum attempts to attract visitors from across the world and makes the museum accessible for both Thai and English speakers. To do this, all of the exhibits’ supplementary text is written in Thai and English. The museum also employs tour guides who speak both languages and videos are also available in both languages.

Tours are almost entirely automated. Tour guides are available to explain exhibits if needed, but the museum relies heavily on sensors that start and stop automated exhibits as visitors approach and leave. This allows visitors to move through the museum at their own pace and spend as much time as they would like at each exhibit.

The methods of presentation utilized at the Hall of Opium Museum are useful to acknowledge when evaluating the King Rama VII Mining Museum. From visiting the Opium museum, our group learned that it is most important to present the full history of a controversial event, so that people can understand what occurred and allow them to make their own conclusions about the issue. The Hall of Opium Museum did this particularly well through the use of:

- **Bilingual text and signage**
- **Personal accounts and histories**
- **Creative presentation methods: dioramas, automated models, and videos**
- **Flexible touring environment with automated exhibit sensors**
2.9 **BACKGROUND SUMMARY**

The Hall of Opium Museum, The King Prajadhipok Museum, and The National Museum were important to investigate to see how museums operate in Thailand and to gather some of their presentation and public relations techniques to improve the mining museum in Mae Moh. The King Rama VII Mining Museum faces the challenge of presenting relevant, historically accurate information regarding EGAT’s past, present, and future practices. Much like other museums, the mining museum must provide an informative, entertaining area to present information in a way that visitors will learn and want to return. The methodology that follows shows the theory that our group will use to uncover the objectives of the museum and see if it is successfully meetings its objectives. The background research helped to create a basis for our evaluation and allowed us to make informed recommendations for the improvement of the museum.
3. **Methodology**

The following chapter outlines the research methods used to evaluate the King Rama VII Mining Museum. A systematic methodology was developed to assess if the museum is currently meeting the objectives set forth by museum developers and EGAT officials.

3.1 **Research Questions**

The research questions used for this project are the following:

- *What are the objectives of the museum?*
- *Are the objectives being met?*
- *What can be done to improve the museum?*

To address each of these questions our group used a series of qualitative and quantitative research tools including archival research, formal interviews, focus groups, observational analysis, and questionnaires.

3.2 **What Are the Objectives of the Museum?**

The initial step in determining whether or not the museum was reaching its objectives was to determine the objectives of the museum. In order to judge the museum’s strengths and weaknesses, it was important to first find out what those involved with the creation and development of the museum hoped to achieve by its creation. Interviews were conducted with the developers, or those who conceptualized the museum, as well as with general EGAT officials.
3.2.1 Formal Interviews

EGAT officials and museum developers were formally interviewed to determine what they viewed to be the objectives of the mining museum. At least two team members attended each interview, one to pose questions and one to record responses. The specific individuals who were interviewed can be found in Table 3.1. This group of representatives was selected as the sample for our research because they had the most knowledge of the museum and its purposes. They were asked the following questions:

- Why do you believe EGAT decided to create and sponsor the museum?
- Why did you feel it was important for EGAT to create the museum?
- What was your role in the conception of the museum?
- What are the primary objectives of the museum at this point?
- Who do you feel is the target audience for the museum? Why?
- Does the museum bring tourism to the region? What information leads you to this opinion?
- What is the most important information that the museum currently conveys?
- What do you think the museum provides for the community and visitors?

Table 3.1 Formally Interviewed EGAT Employees

<table>
<thead>
<tr>
<th>Officials</th>
<th>Museum Developers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governor of Fuel</td>
<td>Geology Exhibit</td>
</tr>
<tr>
<td>Khun Kiertisan</td>
<td>Khun Pairot</td>
</tr>
<tr>
<td>Director of Mae Moh Mine Production</td>
<td>Mining Room</td>
</tr>
<tr>
<td>Khun Chooyos</td>
<td>Khun Damrong</td>
</tr>
<tr>
<td>Deputy Governor of Fuel</td>
<td>Power Plant Room</td>
</tr>
<tr>
<td>Khun Payap</td>
<td>Khun Ponrit</td>
</tr>
<tr>
<td>Assistant Director of Administration</td>
<td>Environmental Management/Community Room</td>
</tr>
<tr>
<td>Khun Prabote</td>
<td>Khun Boontien</td>
</tr>
<tr>
<td></td>
<td>King Rama VII Room</td>
</tr>
<tr>
<td></td>
<td>Khun Nampon</td>
</tr>
<tr>
<td></td>
<td>Head of Public Relations</td>
</tr>
<tr>
<td></td>
<td>Khun Goonchalee</td>
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<tr>
<td></td>
<td>Museum Operation</td>
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<tr>
<td></td>
<td>Khun Paiboon</td>
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<tr>
<td></td>
<td>Senior Engineer of Planning and Administration</td>
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<td></td>
<td>Control Systems</td>
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<tr>
<td></td>
<td>Khun Viboonsak</td>
</tr>
<tr>
<td></td>
<td>Director of Public Relations</td>
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<tr>
<td></td>
<td>Khun Viwat</td>
</tr>
</tbody>
</table>
Following every interview, the gathered data were put into a Daily Interpretative Analysis (DIA), described below. After the data were compiled in this form for all interviews, they were analyzed using Grounded Theory Analysis, which is also described below. The themes that developed during interviews were identified and noted; these themes were then used to discover patterns and trends that emerged among interviewees. After performing Grounded Theory Analysis, the trends generated among respondents were compared to the information found in the Terms of Reference. This provided a way to identify any similarities or differences in these two sources.

3.2.2. Why Formal Interviews?

Interviews were the primary method used for gathering data for this evaluation because they provided a means of gathering personal opinions regarding specific topics. In each interview, there was an interviewee, an individual asking questions, and at least one person recording responses. We interviewed EGAT officials and museum developers in order to gain a better understanding of the objectives of the museum. The formal interviews we conducted generally provided the most information, but we found them to be one of the most time consuming methods of researching. Formal interviews are known to be a time consuming method of research because they require the most effort to analyze findings and compile conclusions (Knight, 2002).

Formal Interview Structure

All of the interviews conducted in Mae Moh were structured so that there was a clear leader for questioning and a clear respondent, or interviewee. We avoided the use
of leading questions, poor attire, and disjointed conversation because they are all factors that can damage the outcome and consistency of an interview (Diamond 2005). The interviewees were asked set questions and given as much time as needed to give a response. The purpose of having the interviewer pose all of the questions was to keep conversation flowing and to keep the interviewee on track. Diamond and Knight both note that in a structured setting, the investigator specifies topics to allow for the generation of more consistent responses and easier analysis of results (Diamond, 2002). Another benefit to conducting interviews is that the subject can identify additional people who may be useful to meet to investigate an issue further (Knight, 2002).

**Informed Consent**

Since some of the aspects of this research were controversial, it was important when we conducted interviews that participants gave their informed consent to participate in the study. Participants were informed of the purposes of the study and told that the information they provided would remain confidential unless they gave explicit permission to use their names. To ensure the validity of collected interview data, it was helpful to restate responses to the interviewee (DIIA, 2006). This allowed the interviewee to clarify their response and confirm that the appropriate conclusions were drawn. The order in which questions were posed during the interview was also kept consistent (DIIA, 2006). For example, it was important to assess the objectives for the museum prior to determining whether the museum was reaching these objectives.
Daily Analysis of Gathered Data

Each day the data that were recorded during interviews were analyzed and summarized using ‘Daily Interpretive Analysis’ (DIA) (Wood, 2000). The DIA consisted of a team member reviewing the interview data the day they were collected. The compiled DIA document contained all relevant data so that the notes did not need to be reviewed again. Relevant quotations from the day were also included. The DIA was broken down into, an analysis of the findings, conclusions which could be drawn, and a section with any concerns developed during the interview (Wood, 2000). Concerns could include conflicting data or new points of interest that were not previously considered. The date, time, location, team members present, and the author of report were also included in the DIA.

Grounded Theory Analysis

Grounded Theory Analysis (GTA) was used to find trends within the data. GTA is an analysis method used where the collected data are read and analyzed to find trends within data. GTA is used in situations where there is no set research hypothesis and the researcher is seeking to understand the research situation by finding patterns in the data (Dick, 2005).

GTA was a useful method of analysis in our investigation because we did not set any response categories for our interview questions; the interviewee was asked general questions regarding their opinions, and these opinions were then compiled and analyzed. GTA was an appropriate method to utilize because the patterns in the responses taken
from each interview and focus group session could be determined by finding the trends within the data.

### 3.2.3. Archival Research

To determine the objectives of the museum our group also performed archival research at the museum and in EGAT offices. The *Terms of Reference*, a document stating the reasons for the creation of the museum, was translated and our group compared the information from this document along with the interview data to uncover the objectives of the museum.

### 3.2.4. Why Archival Research?

Archival research is a form of qualitative research; using this research method was another means of adding validity to the data we collected from the formal interviews (ARTS, 2002). Our group used the *Terms of Reference*, a primary unpublished data source supplied by EGAT, to substantiate the personal opinions of EGAT officials and museum developers.

### 3.3 Are the Objectives of the Museum Being Met?

Once the objectives of the museum according to the EGAT officials, museum developers, and the *Terms of Reference* were ascertained, we sought to determine if the museum was currently meeting its objectives. The objectives of the museum were uncovered and listed according to the agreement and overlap of our archival and primary
sources. The responses given regarding the current objectives of the museum were analyzed in order to develop the following criteria to assess if the museum was meeting its objectives.

- Is the target audience of the museum actually attending the museum?
- Do the visitors’ opinions of EGAT and the Mae Moh mine change after visiting the museum?
- Do the visitors enjoy their visit? Would they return? Would they recommend friends and family to visit?
- What exhibit did the visitors enjoy the most?

These criteria addressed each of the most important objectives of the museum and provided specific areas on which to focus questions needed to make an evaluation.

The museum’s target audience was determined and their opinions about the museum were analyzed based on the museum’s objective of bringing tourism to the region. Visitors’ opinions regarding exhibits were assessed in order to determine if the museum was reaching its objective of informing and educating visitors on EGAT’s operations and environmental techniques, as well as King Rama VII. Visitors’ opinions on the region were analyzed to understand if the museum was succeeding in dispelling preconceptions based on the negative media attention of the past.

3.3.1 Formal Interviews

Formal interviews were conducted with EGAT officials and museum developers to establish if the objectives of the museum are being met. The same manner of questioning and data recording were used as described in the previous formal interview section. EGAT officials and museum developers were asked the following formal interview questions:
• Do you believe that the visitors view of EGAT and the mine/region changes after visiting the museum? What information leads you to this opinion?

• Is the museum meeting its expectations? Why / Why Not? Are these the only questions you asked? Please explain how these questions are intended to provide you with the information about the criteria above.

Further analysis and support of these questions is presented in the following Findings and Discussion chapter.

After the interviews were complete, they were analyzed in the same way as those described in section 3.2.1. Daily Interpretative Analysis and Grounded Theory Analysis were both used as described above.

3.3.2. Archival Research

Archival research was used to assess if the objectives regarding audience development and retention were being met by reviewing the tour schedules and the public relations documents for the museum, including its website. Tour schedules provided information about where visitors were coming from and this was used to determine whether the target audience of the museum was visiting, as EGAT officials had repeatedly emphasized that they would like to have visitors from the entire country. Public Relations documents and the museum’s website were analyzed to find potential opportunities for improvement to help further EGAT’s objectives for audience development and retention.
3.3.3 **Focus Groups**

University students, secondary school students, elderly, and local residents were interviewed in focus groups to determine what they felt about the museum after their visit. The questions, which can be found below, directly corresponded to the criteria developed to determine if the museum’s stated objectives were being met. They related to whether or not opinions changed, if the visit was educational and enjoyable, and if the exhibits provided an understanding of EGAT’s operations in Mae Moh.

The focus groups consisted of three to six people. The process used to form groups can be found in section 3.3.4. Most focus groups were aided by the assistance of a translator or they were conducted with interviewees who were competent with the English language.

During the focus groups, we asked the following questions:

- *Had you heard about the Mae Moh area before? Was the information you heard positive or negative? How does this compare to your feelings now?*

- *What was your favorite exhibit? Were there any exhibits you did not like?*

- *Would you recommend this museum to a friend or family member? Would you like to come back?*

**Daily Analysis of Gathered Data**

After the focus groups, the gathered data were also compiled into a DIA. Once all focus groups were completed, answers were compiled and compared to see where visitors’ opinions overlapped, so that we could gain a better understanding of where the museum could benefit from improvements. The focus groups were primarily analyzed in the same way as those described in section 3.2.1. Daily Interpretative Analysis and
Grounded Theory Analysis were both used to find emergent trends in the data. The demographic characteristics of each group were noted, to allow for analysis of whether or not there were variations in responses from different demographic groups. The responses from the focus groups were analyzed individually and common trends were noted, as well as any inconsistencies between responses.

3.3.4 Why Focus Groups?

Focus groups were used as another form of data collection for this research question. The purpose of using focus groups was to avoid the closed-ended responses that come from questionnaires and surveys (Krueger, 2003). Focus groups also allowed us to gather data from a group of individuals who could bring different opinions and suggestions up for discussion, unlike the one-sided responses gleaned from formal interviews. In a focus group, the researcher takes on a less dominant role and serves as a guide to discussion. This technique was useful in this investigation, because it allowed participants to take an active role in discussion and provide detailed information about their opinions concerning the museum.

Establishing a Sample

To establish the samples for this research, our team used a form of non-probability sampling called Availability (or Convenience) Samples (Walonic, 2007). This method allowed us to work with a number of individuals according to their availability (Walonic, 2007). Our samples were determined by the tour groups that visited the museum. Tour schedules were used to determine the groups with varied
backgrounds in order to get opinions from a wide sample; we ensured that data were collected from visitors who varied in age, origin, and education level. We conducted focus groups with the following groups:

- Mae Moh Government Leaders (3)
- Environmental Science Students, Kasetsart University (8)
- Mae Moh Elderly (6)
- Lampang Students (3)
- Sukhothai Secondary School Students (3)

Each of our focus groups were formed with individuals from the same community or school group so they could be more comfortable giving their opinions. After tours were nearing completion our group asked visitors if they were willing to participate in a brief focus group regarding their visit to the museum. To generate conversation during the focus group, it was important to keep the group to a manageable size, so that participants could voice their opinions, while still benefiting from group discussion. Krueger suggests a manageable size is six to eight people (Krueger, 2003). We kept the focus groups smaller due to a lack of seating for the interviewer, recorder, translator, and focus group participants. The recorder took notes and created the DIA as noted in section 3.2.1.

**Characteristics of a Focus Group**

Brainstorming was enhanced when ideas were presented in a focus group. Focus group participants often feel more comfortable voicing their opinions when in a group setting (Marczak, 1999). Since the EGAT officials and the museum developers placed great value on the opinions of the visitors to the museum, it was valuable to gather candid information from the visitors. Although it is sometimes difficult for participants to
express negative opinions, focus groups were the best option to get the most accurate results, as they allow more discussion in which true feelings can be revealed. Focus group interviews were effective when hoping to capture the comments or language used by the target audience which is of interest to museum developers (Krueger 2003).

Focus group questions must be posed carefully so as not to lead participants to specific answers or limit discussion. In our focus groups, there were five key discussion questions posed to the participants during a twenty to thirty minute session.

In many focus groups, particularly those involving controversial or personal topics, it is beneficial to provide projective situations where a participant could project their personal feelings onto another group of people (Kvale 1995). This proved to be an effective way to counter the Thai resistance to confrontation, also known as ‘saving face.’ This tactic was used to encourage focus group participants to offer their true opinion in delicate situations where they might harbor negative opinions or feel uncomfortable speaking personally (Cummings, 2005). To do this, we asked: Is there anything you think would be hard for others to understand in the museum instead of asking: Is there anything you do not understand in the museum? Although this is a useful technique, it was used sparingly so that the majority of the data gathered could be interpreted as individual personal opinion.

When conducting the focus group, precise notes were taken to ensure proper data collection. The notes were taken by the same two people and recorded in the same manner to maintain consistency in the recordings. Since the role of the interviewer was less dominant in the focus group setting, it was important to note how discussion was generated and who led conversation within the group. The interviewer had to ensure that
one person was not solely leading the conversation and overlooking the opinions of the group. Discussions within focus groups tend to lose direction causing important ideas to be overlooked; therefore, the interviewer must serve as a moderator to ensure useful discussion (Knight, 2002).

3.3.5 Questionnaires

Questionnaires were also distributed to villagers, visitors, and students to serve as another method of determining if the objectives of the EGAT officials and museum developers were being met through the museum’s current operations. A questionnaire is defined as a data-gathering device that is used to collect responses to prearranged questions (Questionnaires, 2003). For our purposes, the questionnaire was distributed with set questions and coded responses to allow for easier data collection and analysis. The questionnaires were distributed to visitors and tour groups. The full questionnaire used for visitors, villagers, and students can be found in appendix A2. The questionnaires included some of the following questions:

- Where did you hear about the museum?
- On a scale of 1-5 what was the image you had of EGAT and Mae Moh before visiting the museum?
- On a scale of 1-5 what is the image you have of EGAT and Mae Moh after your visit?
- Will you recommend visiting the museum to a friend?

Although we encountered difficulties in obtaining responses from visitors, we gathered eighty-one questionnaires. Visitors were frequently rushed when trying to leave the museum, and felt they did not have time to fill out the questionnaire. We were also informed by museum staff members that many Thai people do not like to fill out surveys,
so we had to encourage their participation in our study by personally handing out the surveys and having a translator explain the importance of their participation in our study. Eighty-one surveys, however, were enough to make rough generalizations and find patterns in opinions. The data from the questionnaires were put into an Excel spreadsheet and various forms of analysis were performed, such as the average change in opinion of visitors of a certain age and percentage of respondents who selected each exhibit as their favorite. These spreadsheets can be found in the appendix of this report.

3.3.6 Why Questionnaires?

For our research, questionnaires served to provide quantitative measurable data, which could be used for graphical displays and added validity to the qualitative research that we had found through formal interviews and focus groups. Questionnaires were used in our study to gather data to be used in graphs and other visual summaries for EGAT officials and museum developers to see where improvements could be made in the museum. Questionnaires provided responses from a wider range of people, therefore allowing some generalizations to be made about the data. For example, one of the questionnaire’s coded questions was, “What was your favorite exhibit?” A graph of this information would quickly show which exhibits were doing the best at attracting visitors’ attention and which ones could use improvements. By gathering these data, conclusions were drawn about the feelings of visitors towards the power plant, the mine, and the Mae Moh region.
3.4 **In What Ways Could the Museum Be Improved?**

The final research question our group used in the assessment of the King Rama VII Mining Museum was, “In what ways could the museum be improved?” Our group posed this question to all of the targeted audiences: EGAT officials, museum developers, students, Mae Moh residents, and visitors. We also used observational analysis to address this question.

### 3.4.1 Formal Interviews

We formally interviewed the EGAT officials and museum developers from Table 3.1. The same methods were used as in previous sections. The questions asked were the following:

- *Are there any exhibits you feel should be added to the museum? What?*
- *What if any improvements would you like to see made to the museum?*
- *What else do you think the museum should offer the local community? Why?*

After the interviews were completed, the collected data were analyzed in the same way as those described in section 3.2.1. Daily Interpretative Analysis and Grounded Theory Analysis were both used to find emergent trends in the data.

### 3.4.2 Focus Groups

Students, Mae Moh residents, town officials, and visitors, were asked similar questions in their respective focus group sessions to see what they viewed as potential areas for the museum to improve. The focus groups were conducted as described above.
and in the focus group section 3.3.4. Focus group participants were asked the following questions:

- Is there anything you would like to see added to the museum?
- Is there anything you think should be improved in the museum?

After the focus groups, the data gathered were also compiled into DIAs. Once all focus groups were completed, answers were compiled and compared. The focus groups were primarily analyzed in the same way as those described in section 3.2.1. Daily Interpretative Analysis and Grounded Theory Analysis were both used to find emergent trends in the data. The demographic characteristics of each group were noted to determine if there were variations in responses from different demographic groups. Each question was looked at individually, and common trends were noted, as well as any inconsistencies in the data.

3.4.3 Questionnaires

We also attempted to get suggestions for improvement through the questionnaire, but few participants actually wrote responses.

3.4.4 Observational Analysis

Several interviewees mentioned difficulties with the touring process of the museum, and indicated that certain sections became congested with large tour groups. In order to address this, we also used observational analysis of the museum’s current touring methods. We observed the flow of two groups of visitors through the museum and noted areas in which there was congestion.
3.4.5 Why Observational Analysis?

Observing visitors to the museum provided information on the way they interacted with exhibits. Tracking randomly chosen patrons throughout their visit and observing the way they interact with the museum and its exhibits is a way to determine the effectiveness of a museum’s layout (Diamond, 2002). By observing the patterns of visitors’ movements throughout the museum, it is possible to better understand which exhibits are the most popular and find areas in which there are problems. If an area is constantly full, or constantly empty, changes may need to be made with either the flow of visitors or the exhibits themselves (Diamond, 2002).

We followed two tour groups through the museum to see where congestion occurred and how visitors interacted with exhibits. The collected data was then recorded and suggestions were given as to how to alleviate the congestion and how to better interest the visitors with the exhibits.

3.5 Methodology Summary

The use of established systematic research methods allowed our group to gather valid data that helped to substantiate our final recommendations and improvement ideas for the museum, which are presented later in this report. Our group sought to gather information from a wide range of sources; including EGAT officials, museum developers, local town officials, and museum visitors. A combination of archival research, formal interviews, focus groups, questionnaires, and observational analysis provided raw data for our study and further evaluation of the museum.
4. **FINDINGS AND DISCUSSION**

This chapter presents the findings that were gathered through the completion of the methodology outlined above. These findings were based on the data that was gathered through the use of proven methodologies, which were then used to provide a basis for recommendations for future museum improvements.

The chapter is broken down into the following sections:

4.1 **WHAT ARE THE OBJECTIVES OF THE MUSEUM?**
   4.1.1 Objectives found from Interviews and Archival Research

4.2 **ARE THE MUSEUM’S OBJECTIVES BEING MET?**
   4.2.1 Is the target audience of the museum attending the museum?
   4.2.2 Visitors’ Opinions
   4.2.3 Are there patterns regarding visitors’ favorite exhibits?

4.3 **WHAT CAN BE DONE TO IMPROVE THE MUSEUM?**
   4.3.1 King Rama VII
   4.3.2 Efficiency
   4.3.3 Accessibility
   4.3.4 Community Involvement
   4.3.5 Utilization of Museum Property and Building
   4.3.6 Environmental Management

4.4 **LIMITATIONS OF OUR DATA**

4.5 **CONCLUSIONS**

4.1 **WHAT ARE THE OBJECTIVES OF THE MUSEUM?**

In order to evaluate the effectiveness of the museum it was first important to answer the question, ‘What are the objectives of the museum?’ The following objectives serve as our findings and were determined by conducting formal interviews with EGAT officials and performing archival research regarding the museum’s Terms of Reference.

The objectives identified most frequently were the following:
• To honor King Rama VII
• To create an understanding of EGAT’s mining and power generation operations
• To bring tourism to Mae Moh
• To dispel the effects of negative media attention
• To inform visitors of the environmental improvements
• To present reclamation plans to visitors
• To be a resource for the Mae Moh community

Our findings indicate that the stated objectives of most EGAT officials and museum developers were very similar because creating the museum and determining its objectives was a cooperative effort among many members of the EGAT staff. The statements made during interviews directly reflect the Terms of Reference; there are no significant differences between the sources of information. Information about individuals’ responses regarding each objective, as well as the relationship between these responses and the Terms of References are discussed in the following sections:

To Honor King Rama VII

One of the most common objectives expressed by EGAT officials is the importance of honoring King Rama VII. According to the individual who initially conceptualized the museum, the primary motivation for the creation of the museum was to provide information about King Rama VII. King Rama VII issued a royal decree to preserve coal for the use of the Thai government for the benefit of the people of Thailand (Chooyos, Interview, February 5, 2007). The importance of honoring King Rama is reflected in the Terms of Reference, being the first item listed among the objectives contained in this document. The Deputy Governor of Fuel stated that an additional reason for the creation of the museum was to commemorate the King’s journey to
Northern Thailand during his reign, particularly his stop in Lampang (Payap, Interview, January 26, 2007).

To create an understanding of EGAT’s mining and power generation operations

Each of the EGAT officials agreed that another objective of the museum is to serve as an educational resource to teach visitors about the mining and energy generation process in Mae Moh. The Director of Fuel at Mae Moh believes that the primary objective of the museum is to provide education and entertainment to museum visitors. He hopes that after leaving, visitors will understand EGAT’s mining and power generation operations (Kiertesan, Interview, February 5, 2007). This objective corresponds with three of the objectives listed in the Terms of Reference:

- To be a learning venue for children, students, public
- To inform visitors about geology, the coal mining process, coal utilization, technology in coal production, power generation, and environmental control
- To instill proper understanding about lignite fired power plant and the technology to control environmental impacts

This is clearly an important objective to EGAT, as it was mentioned in formal interviews and also noted in the Terms of Reference.

To bring tourism to Mae Moh to dispel the effects of negative media attention

An important part of EGAT’s land reclamation plans involve turning the Mae Moh region into a tourist destination. Along with providing a service to the local community, this will draw visitors to the region to see the area for themselves. The Assistant Director of Administration and Technology and the former head of Public Relations both stated that the museum was created to improve EGAT’s public image by
informing the public about EGAT’s current environmental control and land reclamation practices in Mae Moh (Pramote, Interview, January 30, 2007 and Nampon, Interview, January 25, 2007). The Deputy Governor of Fuel believes that the museum was initially conceived to bring people to Mae Moh to show them the work that EGAT has done to improve their practices since the 1990s in order to dispel the effects the negative media attention (Payap, Interview, January 26, 2007). The Director of Fuel at Mae Moh hopes that visitors to the museum recognize that EGAT is effectively managing the property and pollution at the site of the lignite mine (Kiertisan, Interview, February 5, 2007).

These beliefs are echoed in the Terms of Reference, which states that the museum should be a place that the public can learn about the measures that have been implemented at EGAT Mae Moh to control the environmental and health impacts caused by mining and power generation. The emphasis placed on tourism and the importance of dispelling previously held negative beliefs indicates that this is one of the primary objectives of the museum, and emphasizes the importance of ensuring that these points are emphasized in the museum’s exhibits.

To present reclamation plans to visitors

The creator of the geology exhibit in the museum believes that the museum also serves to show visitors the plans and current action taking place to reclaim the land that was excavated for mining (Pairot, Interview, January 24, 2007). Museum developers and EGAT officials would like to transition the lignite mining area into a tourist destination once the reclamation of the mining land has been completed. They are hoping that the museum will be one of many highlights in the area when this occurs (Payap, Interview,
January 26, 2007). Although this objective is not specifically listed in the Terms of Reference it is directly tied to other objectives, such as increasing tourism and showing EGAT’s environmental management measures. The process of reclamation is a way to help the local community and is also an important part of drawing visitors to the region.

To be a resource for the Mae Moh community

The final objective for the museum is to serve as a resource for the local community. The Head of Land Lease and Rights, who is also a Lampang resident, believes that the museum was created with the objective of serving the local community by providing educational opportunities as well as a location for them to sell their goods (Nampon, Interview, January 25, 2007). The Terms of Reference states that the museum should be a common-area for the local community by providing an area for local people to earn an income. Although this idea was brought up less frequently than others during interviews, it is still an important part of the museum’s objectives.

Objectives Summary

The Terms of Reference listed very similar objectives to those obtained through formal interviews. This is understandable because as the individuals who were interviewed were involved with the museum’s conceptualization and may have had the opportunity to be involved with the development of the Terms of Reference.

The only item listed in the Terms of Reference that was not repeatedly echoed in interviews was “To be a place for outdoor mining heavy equipment display demonstration.” The outdoor exhibit was mentioned in several interviews as an area that
could be better utilized, but was never listed as an objective of the museum in *The Terms of Reference*.

Through conducting interviews, we found that multiple people declared each objective. These objectives are the basis of the remainder of the evaluation of the museum; without a clear understanding of what the museum was intended to accomplish it is impossible to determine whether it is doing as it should and what areas need improvement.

### 4.2 Are the Museum’s Objectives Being Met?

The following criteria were used to assess if the museum is meeting its objectives. These criteria were determined by our group’s analysis of the museum’s objectives in conjunction with museum theories presented in our background chapter. These criteria helped to develop interview and focus group questions and allowed us to categorize our findings.

- *Is the target audience of the museum actually attending the museum?*
- *Do the visitors’ opinions of EGAT Mae Moh change after visiting the museum?*
- *Do the visitors enjoy their visit? Would they return? Would they recommend friends and family to visit*
- *Are there patterns regarding visitors’ favorite exhibits?*

The museum’s target audience was determined and their opinions about the museum were analyzed based on the museum’s objective of bringing tourism to the region. Visitors’ opinions regarding exhibits were assessed in order to determine if the museum was reaching its objective of informing and educating visitors on EGAT’s operations and environmental techniques, as well as King Rama VII. Visitors’ opinions on the region
were analyzed to understand if the museum was succeeding in dispelling preconceptions based on the negative media attention of the past.

4.2.1 Is the target audience of the museum attending the museum?

The initial step in determining whether the target audience of the museum was visiting was to establish the target audience. After conducting interviews with EGAT officials it was found that visitors from across Thailand were the primary audience. EGAT officials desired both local residents and those from farther distances who had yet to see the improvements made in the region.

To determine if the target audience was attending the museum, our group conducted formal interviews with museum developers and EGAT officials along with looking at the museum’s tour schedules. When the museum first opened all of the EGAT employees were invited to the museum, which amounted to about 3,000 visitors (Chooyos, Interview, February 5, 2007). According to the tour schedule, the museum is drawing visitors from the majority of northern Thailand, as well as further locations to the south, like Bangkok and Raynong. The museum has a clearly outlined schedule for upcoming months and they are efficiently meeting their current target audience, visitors from all over Thailand in all age groups, by reaching out to various elementary schools, secondary schools, universities, and community groups.

To gain a further understanding of how the museum is bringing its target audience, our group distributed questionnaires to museum patrons. Our findings showed that EGAT’s advertising efforts seem to be working to bring in their current target audience.
of visitors. The 81 visitors surveyed in the questionnaires selected several ways in which they had heard about the museum.

- 23% from other EGAT activities, such as at the flower show or marathon
- 22% from teachers or schools
- 18% from television
- 11% from friends
- 7% from newspaper
- 7% from family
- 5% from radio
- 4% from the website
- 2% from colleagues
- 1% responded other

For the majority of the advertising methods, there were no significant differences among groups. Surprisingly, teachers/schools resulted in a higher percentage of community group visitors than school visitors. All government agency visitors stated that they first heard of the museum from other EGAT activities, and all private company visitors heard from friends. This can be attributed to the small number of these types of visitors that completed the survey. All other methods of advertising were equally distributed among visitor groups.

From this information, we could not determine any distinct pattern in which to suggest that a particular marketing technique is better at reaching a particular audience over any other. These categorical data do suggest that word of mouth, be it from teachers, friends or other events, is one of the best ways to reach visitors because they received high responses as seen above. This conclusion further emphasizes the importance of making the museum and enjoyable place to come so that visitors will encourage others to visit.
4.2.2 Do the visitors’ opinions of EGAT Mae Moh change after visiting the museum?

After the environmental problems caused by mining in the early 1990s, many Thais developed a negative image of EGAT in Mae Moh. This negative image is still a concern for EGAT officials and they see the museum as an important way to improve the opinions of the Thai people. One of the major objectives for the museum, indicated by museum developers and EGAT officials, was to have visitors leave with a positive image of EGAT and their mining and power generation practices.

Visitors’ Opinions of EGAT Mae Moh

In order to determine whether or not the museum has been successful in changing visitors’ opinions about EGAT at Mae Moh, focus groups were held and questionnaires were distributed to museum patrons. The questionnaire asked visitors to rate their opinion of EGAT Mae Moh both before and after visiting the museum on a scale of 1-5, 5 being the highest rating. Those who selected a 1 or a 2 were considered to have a negative opinion of EGAT.

Prior to their museum visit, six people selected a 1 or a 2 for their rating, which equated to about 7% of our sample. After visiting the museum, three of the visitors’ negative opinions remained negative and the other three changed to a non-negative rating (ie. 3, 4, 5). A similar percentage of visitors who were interviewed in focus groups had a negative image, but all of these left with a non-negative image. Students from the Environmental Science Department of Kasetsart University were educated about the environmental issues that come from sulfur dioxide emissions and they knew of the past environmental problems that had occurred in Mae Moh. After their visit, their opinions
changed; they were impressed by the grounds and the information portrayed in the museum. They said they could see that EGAT has been taking measures to control the pollution that was once created at the Mae Moh mining and power generation facility. Similarly, students from a Sukhothai secondary school came to the museum with negative opinions of the region that they had developed after being exposed to negative media from television and newspapers. After visiting the museum, the students stated that they no longer believed that the negative media attention of the past remained an issue for the area.

The distributed questionnaire indicated that 93% of visitors had a non-negative image of EGAT prior to their visit, as suggested by providing a ranking of 3, 4, or 5. Of these non-negative opinions, five people or 6% indicated a drop in their opinion of EGAT after visiting the museum, 37% of the visitors had an improvement in their opinion rating. Overall, after visitors had visited the museum, 98% left with a non-negative image of EGAT as indicated by responses to our questionnaire. The findings we gleaned from focus groups with secondary school students from Mae Moh showed they maintained or improved their positive image of EGAT after visiting the museum. Since they live in the community, they were already aware of the changes that EGAT had made to reduce their emissions and their positive opinions were maintained after seeing the museum. Elderly from Mae Moh also felt that EGAT has made efforts since the 1990s to improve their emissions standards. They indicated that they no longer see villagers with headaches and ailments they had experienced in the past from the pollution, therefore they had a positive image of EGAT prior to their visit. Our findings indicated that their opinions of EGAT remained the same, but they felt more informed about the history of the mining after their
visit. The elderly visitors stated that their opinions continue to improve the more they learn about EGAT and the mine.

Several conclusions can be drawn from the data that was gathered with the questionnaire. Because 93% of visitors began with a non-negative opinion, it is clear that the museum is not attracting its most critical audience, who are those who would come to the museum with a negative opinion of EGAT Mae Moh. From the objectives it can be determined that the museum should be attracting a critical audience to dispel the effects of the negative media attention and to create an understanding of EGAT’s mining and power generation operations. From these findings it can be concluded that the museum should seek to attract a critical audience, ideas for accomplishing this are presented in the recommendations chapter.

The questionnaire data can also serve to support the argument that the museum is presenting material in a non-biased manner because 6% of those patrons who filled out a questionnaire had a drop in their rating of EGAT Mae Moh. The findings show that the museum is currently providing a forum where visitors can form their own beliefs about the information presented. This should not be seen as a failure of the museum because it can indicate that the museum is presenting information in an objective, truthful way.

**Visitors’ Opinions of the Museum**

One hundred percent of those who filled out the questionnaire indicated that they would like to return to the museum and 99% would recommend the museum to friends and family. All visitors who participated in focus groups said that they enjoyed their visit, they would recommend that their friends and family visit and if they had the chance they
would like to visit the museum again. Although the primary objectives of the museum are to educate visitors and present information, it is important to provide a pleasurable experience. It has been shown that visitors to museums retain more knowledge if the museum experience is entertaining and enjoyable (Black, 2005). Therefore, the fact that all visitors enjoyed their visit implies that the museum is providing a good learning environment. Having a high percentage of visitors who would recommend the museum to family and friends is important because the highest percentage of museum visitors had heard about the museum from recommendations from past visitors (AAM, 2006).

4.2.3 Are there any patterns in visitors’ favorite exhibits?

The current museum contains the following exhibits:

- *King Rama VII Room*
- *Geology: how the earth was created*
- *Fossils: from the Mae Moh area*
- *History of Mae Moh Mine*
- *Coal Fired Power Generation*
- *Environmental Impact Control at Mae Moh*
- *Environmental Management*
- *Community Development*

Our findings regarding visitors’ favorite exhibits were gathered after conducting focus groups and distributing questionnaires. Visitors from the Kasetsart University in Chanburi found the best exhibits to be the three dimensional animation video and the view from the deck of the museum. The secondary school students from Sukhothai also enjoyed the three dimensional movie. Elderly visitors to the museum enjoyed the geology and elephant exhibits, which were part of the fossil and dinosaur exhibit. Local town officials enjoyed the geology exhibit and the three dimensional movie. In focus
groups, visitors never mentioned the King Rama VII room as one of their favorite exhibits. This is an important consideration in future recommendations because honoring King Rama VII was consistently mentioned as one of the most important objectives of the museum.

Data gathered from the distributed questionnaires indicated that most people enjoyed the dinosaur exhibit, the mining exhibit, and the power plant exhibit. These data were collected from 81 museum visitors. Figure 2 illustrates the percentage of these visitors who selected each exhibit (listed in order of appearance in the museum) as their favorite.

![Favorite Room/Exhibit](image)

**Figure 2: Favorite Exhibits**

These gathered data reveal several shortcomings in the museum’s current operation. Museum developers and EGAT officials stated that the focus of the museum is to educate visitors on EGAT’s environmental management techniques and to show what they have done for the community, as such the environmental and community exhibits are essential for the museum to reach its objectives. These exhibits were
selected as a favorite by the fewest number of survey respondents and these exhibits were not selected as a favorite in focus groups. This data shows that the museum should seek to address because these are the exhibits that serve to present essential information to visitors.

Our findings suggest that because only 19% of the questionnaire participants selected the King Rama VII Room as their favorite and no focus group participants noted that this room was their favorite, this room could use improvements. It is also important to note that the community and environmental exhibits have the lowest rating of 1% and 5% respectively. This shows that these exhibits are not affecting the visitors with enough influence for them to list them as their favorite. These exhibits should some of the most powerful within the museum to meet the museum developers and EGAT officials’ objectives to dispel the negative media attention and to be a resource for the Mae Moh community. Our group’s suggestions for improvements to these exhibits can be found in the recommendations chapter.

4.3 What can be done to improve the museum?

Another research question that was posed during the interview sessions was: What can be done to improve the museum? The following sections discuss opportunities for improvement in areas directly derived from our research.
4.3.1 Adding information and artifacts to the King Rama VII Room

The Head of Public Relations during the construction of the museum would like to see more added to the King Rama VII Room (Nampon, Interview, January 25, 2007). He suggested that this be done through the addition of more artifacts from King Rama’s life. Town officials also stated during a focus group that they would like to see more information presented about the King’s life (Town Officials, Interview, February 9, 2007).

The King Rama VII Room’s need for improvement is further reinforced by the fact that, as mentioned above, visitors never mentioned the room in their list of favorites during focus group interviews. This therefore means that the museum is not meeting this specific objective and the room could greatly benefit from improvements.

4.3.2 Improving Museum Efficiency

The efficiency of the museum would be improved by increasing its hours of operation. Tour groups could be dispersed throughout the day, which would limit crowding. The creator of the geology exhibit for the museum noted that tour groups often get backed up around exhibits and in the waiting area. He suggested that this issue could be solved by future expansion or by limiting the size of tour groups (Pairot, Interview, January 24, 2007).
4.3.3 Improving Museum Accessibility

The Deputy Governor of Fuel would like to see an increase in the operational hours of the museum and he would like to make the information displayed in the museum more accessible to the people of Thailand. To do this, the Chief of the General Services Department would like to see the museum incorporate traveling exhibits to make information more accessible to the public. The traveling exhibits could be brought to school or community centers to increase knowledge about EGAT and their mining operations in Mae Moh (Goonchalee, Interview, February 1, 2007).

4.3.4 Promoting Community Involvement

The creator of the King Rama VII Room believed that the community should become more involved with the museum (Nampon, Interview, January 25, 2007). He suggested that local secondary school students lead tour groups. Other officials who were interviewed would like the kiosks to the left of the current museum be more actively utilized for local people to sell goods (Pairot, Interview, January 24, 2007). The kiosks were used to sell OTOP, One Tambon One Product, items in the past but most visitors to the museum do not have enough money to support this as an ongoing use for these kiosks (Viwat, Interview, February 9, 2007). As such, they are only used during the peak seasons when activities like the flower festival and mini-marathon bring in visitors who are more likely to spend money.
4.3.5  **Utilization of Museum Property and Building**

EGAT officials indicated that they would like to see more balanced usage of the museum property, which included the operating building, the old machinery, and the kiosks to the left of the museum (Pramote, Interview, January 30, 2007). Currently, museum tour groups take guided tours within the museum and the outdoor exhibits are not a part of the group tour. Museum developers and EGAT officials would like to see the outdoor machinery exhibits and the kiosks better utilized to have visitors experience the entire museum property.

Museum officials also stated that the utilization of the actual museum building could be improved. The creator of the Geology Exhibit indicated that the museum tends to get congested during the tour group sessions and he was eager to see the flow of the indoor museum improved. To investigate this further, our group conducted observational analysis of two smaller tour groups. The groups were thirty-three and thirty-seven visitors each. Some of the major areas of congestion were found to be at the main entryway, leaving the three dimensional movie and entering the Dinosaur Exhibits, at the conveyor belt entering the Mining exhibit, at the Mine Pit exhibit, and at the Power Plant exhibit. For detailed images regarding the layout of the museum, see the appendix A4. The information below serves as a basis for further analysis of the museum set-up and visitor queuing.

At the main entryway, while visitors are waiting for their tour to begin they cluster around the front of the museum with little to do. Many tour group visitors were seen sitting on the floor, talking among themselves, and they had nowhere to direct their
attention. This problem was not alleviated with the start of the tour; students were still sitting on the ground and were not focused on the first presentation video.

The three dimensional movie has the capacity to fit fifty visitors, so when leaving the three dimensional exhibit and entering the first part of the Dinosaur exhibit there is congestion due to the limited space. Observational analysis showed that when entering the room only twenty-two students fit before people either were forced to cramp together, stand far enough back where they could not hear the speaker, or they were forced to move on to the next exhibit. Once the group moved on to the next exhibit, the stragglers did not have the chance to see the exhibit or were forced to miss the speaker at the next station.

The conveyor belt entering the Mining exhibit was also an area of congestion. The entryway is very small and the students were rushed through it so everyone could enter and they were not able to take time to look at the exhibit.

At the Mine Pit exhibit there was always a speaker who presented additional information about the display. The room is very small and can only fit twenty-five to thirty people. Also there are two computers in the room. These computers are very ineffective with a large group because the group is usually in the room for a limited time and only one or two people can use them. There is also a limited amount of space around the mine pit model.

The Mining diorama exhibit was very hard to see for visitors who were not standing in the first few rows. When the tour groups were observed only seventeen of the thirty-three and twenty of the thirty-seven actually stayed and watched the display. Others tried to stay and watch, but because they could not see the exhibit, they moved on
to the next room without getting the information. This exhibit presents the reclamation plans for the area, as well as the history of mining, making it one of the key exhibits in the museum. If visitors are not able to see the display, it is impossible for them to gain any knowledge, limiting the museum’s ability to meet its objective of presenting reclamation plans to visitors.

4.3.6 Environmental Management

EGAT officials and museum developers highlighted the importance of informing visitors about EGAT’s environmental management to be a key objective of the museum, but EGAT’s current Environmental Management exhibit was rarely selected by those who filled out the questionnaire, which reinforces the need for this information to be portrayed more effectively in the museum. Adding more information to the current environmental management exhibit might make it more effective as an educational resource for visitors. It could also be valuable to include quotations from local residents about how EGAT’s environmental management practices have improved the air and topography in the Mae Moh region (Town Officials, Interview, February 9, 2007). A student from Rajabhat University, who is also a Mae Moh resident, indicated that the local residents have been satisfied with the environmental initiatives that EGAT has undertaken in the past ten years.

Along with the importance of increasing the current environmental exhibit, several interviewees noted their desire to see a conservation exhibit added to the museum. EGAT has worked hard to reduce emissions and reclaim the mining land for future use, but EGAT cannot be held solely responsible for environmental awareness and
conservation. Many interviewees and focus group participants stated that every Thai must play a role in maintaining the environment. The Head of the Fuel Department suggested that a conservation exhibit would be a beneficial addition to the mining museum. He does not believe that the Thai people are fully aware of the need for saving energy and such an exhibit could change their attitude towards conservation (Kiertisan, Interview, February 5, 2007). Environmental Science Students from Kasetsart University believe that the Thai people are not fully aware of conservation methods. The students believe that the best way to make people aware of necessary conservation efforts is education and this could be encouraged by a conservation exhibit at the mining museum.

4.4 LIMITATIONS OF OUR DATA

Although the data gathering process followed established procedures, it is important to note the limitations in our results. Several issues arose during the evaluation process that may have affected our data and must be considered when reviewing the validity of our findings.

The language barrier was an issue in gathering data. We relied on the expertise of our translators to gather useful information from Thai speaking visitors. Our translator changed several times and this inconsistency led to gathering more detailed information at some focus group interviews and less detailed information at others. Most of the focus groups that were conducted at the museum with tour groups were done with an inexperienced translator who often gave one word answers, so it was difficult to get significant data from some of the focus groups. Focus groups went much smoother when we had a fluent translator or we were interviewing individuals who spoke English, like
university students and EGAT employees. Much of the archival research that we conducted was done through translations of Thai documents and information might have been lost through the translations.

Another shortcoming that could be underlying our data is the Thai belief in ‘saving face’. Thai people are not likely to indicate that they are unhappy with a situation, so if they did not like the museum, it is possible that they would say positive things to ‘save face’. It is not in the Thai culture to speak of shortcomings or problems. This was also an issue when we asked about improvements for the museum. Many interviewees and focus group participants were hesitant to suggest ideas for improvement. Likewise, those who filled out the questionnaires may have placed high marks to avoid presenting a negative opinion.

There were several limitations with our collected data. More accurate data could have been gathered from distributing questionnaires to a sample size larger than 81 visitors. Data gathered from questionnaires becomes more representative of the overall population as the number of respondents increases. An 81 person survey is able to provide valid results, but increasing the number of surveys increases the validity and would give a higher level of confidence in the gathered results.

There were also some additional issues that arose in our focus group sessions. The museum’s structure of strict tour schedules often left the focus group participants with little time to answer questions. When participants were asked their favorite exhibit, they were not given a list and were free to chose anything they remembered from their visit, whether it be an entire room, the view, or a single artifact. Those who filled out the questionnaires selected from a specific list. The overlap between these two sets of data is
difficult to analyze specifically, but more broad conclusions can still be drawn from the data.

4.5 **Conclusions**

Important findings were generated from our research even though our evaluation has inevitable limitations. The museum’s objectives were successfully uncovered and analyzed. The objectives were used to create criteria which would uncover if the museum was operating to its full potential by meeting its objectives. Although many of the objectives were being reached, it was determined that there were still several areas that could use improvement. The following chapter provides recommendations for possible future improvements to the museum according to the findings presented in this chapter.
5.0 **RECOMMENDATIONS**

The following recommendations, based on the findings presented in the previous chapter, are separated into short-term and long-term improvements. This structure was chosen so that the museum improvements can be prioritized for the formal dedication ceremony by Princess Sirindhorn of Thailand in June of 2007. The short-term improvements are important and feasible recommendations that should be implemented before the ceremony. Over the past year and a half, the museum’s operation has been successful at entertaining and bringing visitors to the Mae Moh region, however, the implementation of the following recommendations will serve to increase the museum’s educational value, entertainment, and overall efficiency for the benefit of visitors.

5.1 **SHORT-TERM RECOMMENDATIONS**

The short-term recommendations are those changes that are fundamental for the museum to operate at its fullest potential for the dedication ceremony by reaching the following objectives:

- *To honor King Rama VI*
- *To inform visitors of environmental improvements, and to present reclamation plans to the visitors*

5.1.1 **To Honor King Rama VII**

The King Rama VII room should be improved by adding more visuals and artifacts. The King Prajadhipok Museum in Bangkok has traveling exhibits which could potentially be brought to the mining museum. The room has the space to display more artifacts, text, and other items relating to King Rama VII, which would enhance visitors’
understanding of his important role in the development of Thailand. Some potential artifacts for the room can be the clothes that he wore on his journey to the north, letters that he sent during his travels, and quotations from his speeches (Weeranuj, Interview, January 19, 2007).

As noted in the Findings and Discussion chapter, several interviewees suggested that this room be improved. When focus group participants were asked to name their favorite exhibit, no one mentioned the King Rama room. The questionnaire data showed that only 19% of visitors listed the King Rama room as their favorite. Improving this room should be an important short-term initiative for the museum because those involved with the creation of the museum stated that honoring King Rama VII is one of its primary objectives.

To improve this room, the museum could purchase artifacts from King Rama’s life. The director of the King Prajadhipok museum said that the museum has a loan system for materials and information about the King, which could be used to enhance the mining museum’s information.

5.1.2 To Inform Visitors of Environmental Improvements

Many objectives of the museum are centered around dispelling the effects of negative media attention and to inform visitors of the environmental improvements being made in Mae Moh. As stated in the background, an effective museum serves to offer unbiased information to the visitors. The intention of the museum is not to convince the patrons of the good that has occurred in Mae Moh, but it is to present truthful information in order to let visitors generate opinions based upon informative exhibits.
The museum currently seeks to achieve this objective through the current Sulfur Dioxide Monitoring exhibit. The monitoring display shows the levels of sulfur dioxide gas in the air at the several monitoring stations around Mae Moh. Focus groups found the exhibit difficult to understand, particularly the readings on these monitors. The exhibit has no information about sulfur dioxide. The levels alone do not describe the toxicity of the pollution generated, or what harm they can cause to human health. To improve this situation, explanations of sulfur dioxide should be presented at the exhibit along with comparative information from other countries regarding safe and unsafe sulfur dioxide levels. Sulfur dioxide levels from other coal plants around the world can also be displayed so visitors can draw their own conclusions about the environmental achievements of EGAT in comparison to other countries that utilize coal for power generation. It is very important for visitors to fully understand the significance of the information being shown on the monitors because these data can show visitors the improvement that has occurred in the area over the past decade. The sulfur dioxide monitoring exhibit would also be an appropriate location to include information about the efficiency and effectiveness of the scrubbers that were installed in the stacks. The exhibit should explain how the scrubbers work to lower emissions. It would also be beneficial for this exhibit to display historical sulfur dioxide levels in the Mae Moh region to prove to the visitors that the emissions from the plant have been reduced by EGAT’s environmental efforts.

The questionnaire showed only 5% of visitors listing environmental exhibits as their favorite, which shows that these exhibits do not leave much of an impression. Several interviewees, like the Lampang Town Officials, said that the exhibit needs to be
clarified so that visitors of all ages and education levels can understand it. The responses
to the questionnaires indicated that visitors who had prior negative opinions of EGAT
Mae Moh were not impressed by the sulfur dioxide exhibit, where, ideally, this should be
the most persuasive exhibit targeting those who enter the museum with a negative
opinion. good point Visitors’ understanding can be improved at this exhibit by adding
facts and text on the walls surrounding the monitoring station. If improved, this exhibit
will effectively educate visitors by presenting facts and a more complete history of
mining and power generation in Mae Moh.

5.1.3 Energy Conservation

As presented in the background chapter of this report, EGAT is working to
promote a public awareness of conservation through the creation of several programs,
like the Green Learning Rooms. Although educating visitors about conservation and
reducing consumption is not currently an objective for museum we believe that it would
be a beneficial exhibit based on suggestions gathered from visitors and EGAT officials.

An exhibit encouraging public responsibility should be a short-term objective for
the museum because it will integrate EGAT’s initiatives with the initiatives that the
public can take to preserve the environment. Currently, as seen through the responses to
the distributed questionnaire, only 5% of visitors listed the current environmental exhibits
as their favorites, so this area of the museum needs to be improved.

Our group conducted interviews at the museum to assess if the environmental
conservation exhibit would be an effective exhibit. According to students from Kaset
University’s School of Environmental Science, the best way to encourage Thais to
conserve is through education. The Director of Fuel at Mae Moh felt that visitors should learn about their responsibility to conserve when they visit the mining museum. Educating visitors of the role they play in reducing pollution and energy consumption would complement the efforts that EGAT has made to reduce their impact (Kiertisan, Interview, February 5, 2007).

From interviews and focus groups, we believe that adding an energy conservation exhibit to the museum would be an effective means of getting the visitors involved in EGAT’s endeavor to promote public conservation. This would also allow the museum to further provide an educational resource to the community. With the creation of this exhibit, visitors would leave better informed about not only the power generation process, but also the importance of energy.

**EGAT’s Green Learning Room**

This short-term improvement can be modeled after EGAT’s existing Green Learning Rooms to make for a quick and effective addition to the museum. Princess Sirindhorn herself supported the creation of a series of Green Learning Rooms in Cambodia, further emphasizing the importance of developing this exhibit before her visit in June (EGAT, 2003).

As described in the background chapter, the rooms teach students what they can do to conserve energy. In a recent study by Chiang Mai University the rooms have been evaluated and proved successful. The program that educates school aged children on the links between energy use and the harmful effects on the environment won the second prize for the Energy Globe Awards in 2001 in the category of Learning for the Future.
EGAT has created 370 of these interactive Green Learning Rooms throughout the country of Thailand for children in kindergarten and elementary schools. They would therefore be ideal for the museum’s audience of school children, and would allow the museum to fulfill a key objective of all museums, providing an educational resource to visitors (EGAT, 2003).

5.1.4 Mae Moh Mining History

In order to understand the environmental progress of the Mae Moh mine and power plant, it is important to understand the full history of lignite mining in the area. The Nippon Mining Museum, as noted in the background chapter, is similar to the Mae Moh mining museum. Their main exhibition hall contains displays that center on the history of the region, the utility itself, and the measures taken to reduce pollution in the area (Nippon Mining Holdings, Inc., 2006). Similar displays would be appropriate within the King Rama VII museum. For example, unless visitors first understand that lignite mining requires removing large amounts of earth and vegetation they cannot fully understand and appreciate the extent of EGAT’s reclamation efforts. Displaying this information together allow people to develop their own conclusions about EGAT’s practices. This would work well here, because museums should provide a venue for the presentation of controversial material in an objective manner, which allows visitors to draw their own conclusions about the issue in question (AAM, 2006). The history of the area can serve as a way to show how EGAT’s practices in the area have changed as technology has improved.
5.1.5 Improving the Souvenir Shop

EGAT officials would like Mae Moh to transform into a place tourists want to visit. Once this desire is realized, the museum will likely become a stop on tourists’ visit to the region. Our research revealed that most of the current visitors to the museum do not have a lot of money to spend on souvenirs. The museum’s souvenir shop can cater to these visitors with limited resources by selling less expensive products.

Postcards are an inexpensive and informative item, which could display pictures of the reclamation project. The souvenir shop can also sell maps containing the plans for the future of the mine and surrounding area. Calendars and postcards would support the museum’s key objectives of making visitors aware of the environmental improvements in the area as well as the reclamation plans for the future. These simple products have the potential to reach out to those who have not visited the area themselves.

5.1.6 Entryway

As a short-term solution to the issue of congestion at the entryway, our group suggests that benches be put in the entrance to the museum. As discussed in section 4.3.5, it was found both through several focus groups and observational analysis that the museum currently faces issues with congestion and an improperly structured waiting area. The addition of benches would allow visitors to come in and sit while they wait instead of beginning to wander around the museum upon their arrival. Activities, such as interactive exhibits, can also be added to the entryway to give visitors something to do while they wait for their tour to begin. Our suggestions for the locations of entryway benches can be found in appendix A4 of this report.
5.2 **LONG-TERM RECOMMENDATIONS**

The long-term recommendations are those recommendations that can be implemented after the formal dedication ceremony. These tentative recommendations require further research to determine what will work best for the mining museum.

5.2.1 **Structure of Visit**

Based on our findings regarding museum congestion, our group also recommends moving away from the current guided tour method of moving visitors through the museum. These tour groups cause long lines resulting in some visitors being unable to hear information, and losing interest in the tour. Our findings indicated that congestion occurs throughout the museum, in several areas: the entryway, three-dimensional-movie entering the Dinosaur exhibits, conveyor belt entering Mining exhibit, mine pit exhibit, and the power plant exhibit.

Observational analysis suggests that barring any structural changes to the museum congestion will continue to occur as long as large tour groups of 100-200 people are formally guided through the museum. As Portal argues and our own observations of tour congestion and queuing confirm, guided tours are an ineffective way to handle large groups of people (Portal, 2004). The guided tour method only attempts to satisfy the majority of the group, with fixed starting times duration at each exhibit, rather than interests of individuals (Portal, 2004). Operating with the current large guided tours is not the ideal way to present information to patrons due to the museum’s size constraints of the current museum. The tour groups are generally broken up into smaller guided tour groups of about fifty people, but even in a group as small as thirty, visitors are still unable
to comfortably view all of the exhibits. Our suggestion is to no longer use guided tours as the primary method to move visitors through the museum.

Stopping the use of guided tours would be a long-term change for the museum because different methods of directing visitors would need to be tested to see which methods work best. Handouts might be more effective for younger students, whereas headsets would be better for older visitors; this should be proven by conducting trials and distributing evaluative questionnaires to participants in these trials.

If the museum switches to a more flexible atmosphere where visitors are given a less structured schedule, they could go on a self-guided tour with the help of a handout or headset. A self-guided tour or an automated tour would allow for more or less time at each exhibit depending on the visitor's preference, and it would limit congestion throughout the museum. Visitors can start their museum experience when they choose or the museum can start groups at timed intervals. Those who are less interested can quickly glance at each exhibit and those who are more interested can stop at the exhibits that peak their interest.

The didactic teaching methods that are used in structured tour groups do not promote learning, as was mentioned in the background chapter of this report. It is best to use experiential learning where visitors can get involved with the exhibits. The King Prajadhipok museum in Bangkok offers experiential learning by utilizing scavenger hunts to simultaneously entertain and educate young museum visitors (Weeranuj, Interview, January 19, 2007). Through an interactive approach, museums are more likely to impart a memorable experience and inspire visitors, which will in turn allow more of the presented material to be remembered (Black, 2005). Other methods, like automated tours
using sensors in exhibits, similar to those in the Hall of Opium Museum, could also be used so that audio will be triggered when visitors enter a room.

**Traveling Exhibits**

We also suggest the museum create and use traveling exhibits. The National Museum in Bangkok has a van that travels to different schools and community centers to give presentations. The curator of the National Museum stated that this not only provides a resource for the community by educating visitors who cannot attend the museum themselves, but also increases the public’s awareness about the presence of the museum. A similar service would be an effective means of reaching those visitors who cannot make it to the museum, as suggested by the Deputy Governor of Fuel at Mae Moh. The King Rama VII Mining Museum would be able to educate a wider range of people by doing this. Sending the traveling exhibit at local schools would allow the museum to better serve the local community. If the exhibit was sent to a more distant location, it would be possible to reach an audience that would most likely not be able to visit the actual museum.

**Thai and English Text**

As the museum expands, we suggest that the amount of both Thai and English text in exhibits be increased. The addition bi-lingual signs could also aid in visitor learning and flow at the museum. Most importantly, presenting information effectively in two languages allows the presented material to be available to more people. Both Thai and English signs are used effectively throughout the Hall of Opium Museum in Chiang
Saen, Thailand. It is important for visitors to be able to understand museum signs because signs let people know where they can find exhibits, as well as alerting visitors to upcoming presentation times. Proper explanations at exhibits can significantly increase visitors’ understanding of the material presented (Black, 2005). Informational signs also allow visitors to move efficiently throughout a museum. It was found that the flow of visitors through the museum is a problem in the current operations of the museum, and additional signage would be a simple, inexpensive way to work to improve this.

5.2.2 Circulating Visitors throughout the Museum and Utilizing Museum Grounds

To aid in circulating the visitor density in the museum and throughout the entire property, as desired by EGAT officials, our group recommends that during the off-season, the kiosks be used as a more functional part of the museum by bringing people to the external museum property. In the past, the kiosks have been used to sell OTOP products, but they have worked unsuccessfully during normal museum operation; they are currently only used during annual EGAT events, like the marathon and flower show. We suggest that the kiosks be used as the starting point for the museum, not for the purpose of making purchases, but to allow the visitor to experience the entirety of the museum grounds.

The new approach of starting the visitors outside will promote better use of all of the museum property. The tour can start with the kiosks, where visitors can sign in and receive a brief orientation from a museum staff member along with appropriate handouts or headsets for their tour. After they have visited the kiosks, they can cross to the path nearby, and follow it through the outdoor exhibits. The path ends at the museum building.
so visitors could then move inside and see the indoor exhibits. The kiosks can also serve as an alternate vendor for beverages and other food items, which are currently being sold at the entrance to the museum and the café. These items would be sold as a convenience item which they can bring with them as they peruse the outdoor property or to bring on their drive home.

The current café should also be better utilized to balance the flow through the property. The initial plan for the museum called for the computers in the café to be used to provide additional information to interested visitors, to keep the amount of text displayed by the actual exhibits to a minimum. From our observations, no visitors took advantage of this computer resource as the system was not fully completed and there was no signage for the room. There are two ways this area could be more efficiently utilized. The computer system could be completed or the museum could eliminate the use of computers and have the room contain handouts regarding the exhibits. The latter solution would most likely be less time consuming for visitors, since they would not have to search for the information on the computer. Either way, additional signage should be placed around the museum to inform visitors about the availability of the information.

5.2.3 Increase the Hours of Operation

Our findings lead to the recommendation that the museum should increase its hours of operation. Currently the museum is only operational for four non-consecutive hours per day. Increased hours would transform the museum into a more functional building where visitors outside of large groups could visit, including local Thai families or foreign tourists who may not be attached to a Thai tour group. According to the
American Association of Museums, museums must try be accessible to visitors on a schedule that meets the visitors’ needs (AAM, 2006). During our time at the museum, we found that very few visitors came outside of large tour groups. This limits the potential audience of the museum.

This transition should be on a trial basis, so that visitor attendance records can be monitored to see when it is most effective to have the museum open. It could be open late one night a week for visitors to see special presentations and open later on the weekends for non-guided tours, but recommendations cannot be made until further research regarding visitor attendance patterns has been conducted.

5.2.4 Improving the Museum for Return and Regular Visitors

Most of the focus groups that we conducted were with first time visitors to the museum; each visitor who completed the questionnaire or who was interviewed in a focus group said that they would like to return to the museum. In order for visitors to return to the museum, it is important for the museum to provide attractions that change over time, so visitors will be eager to return and have the opportunity to learn new things with each visit (Black, 2005). As stated in our findings, 60% of people who completed the questionnaire were attending the museum for the first time. To inspire these first time visitors to become repeat or even regular visitors, there must be attractions that make the next trip to the museum different from the first. Our recommendations are the following: creating additional three dimensional movies, changing exhibits, hosting special speakers, and holding special events.
**Three Dimensional Movie**

In order to draw return visitors, our group recommends the museum’s three-dimensional movie be changed occasionally. The three-dimensional movie was most frequently listed as focus group participants’ favorite exhibit, however, the same movie has been playing since the museum’s opening a year and a half ago. Returning visitors will not want to watch the same twelve-minute movie each time they visit the museum.

In order to maintain the high level of satisfaction with the movie, it will be necessary to change it in the future. Several EGAT employees and town officials interviewed said that they felt that the current movie should be changed for the reasons above. This can be a short or long-term change for the museum. The museum could either make or purchase two additional movies right away about mining history or power generation methods, custom movies could also be made for the museum, which would take longer. These three movies can be alternated on a daily basis; for instance, the current movie could be shown on Tuesday and Wednesday, and the new movies could be shown Thursday and Friday or Saturday and Sunday. Publicizing these showings would attract museum patrons to visit on different days and see different movies. The museum could supplement this method by purchasing a new movie every six months to allow for a long-term change as well. Movies could include more information about coal or other sources of energy utilized by EGAT to generate electricity for the people supporting the objective to increase understanding of EGAT’s power generation operations. These movies could be used to both educate visitors as well as provide an incentive for their return.
Changing Exhibits

Another key way we recommend to increase the number of return visitors to the museum is to rotate the museum’s exhibits. Along with changes to permanent exhibits mentioned elsewhere, the museum should consider the inclusion of temporary exhibits. As suggested by several interviewees, these temporary exhibits can provide information on current events that relate to mining, geology or energy generation, such as an exhibit on earthquakes following after one occurs. This would allow visitors to learn about current events and it would certainly make the museum a resource for the Mae Moh community, which is an objective for the museum.

The former head of Public Relations had a desire to see rotating exhibits incorporated into the museum (Nampon, Interview, January 25, 2007). The curators of both the National Museum in Bangkok and the King Prajadhipok Museum in Bangkok stated that they have found temporary exhibits to be an efficient way to bring back return visitors. The National Museum in Bangkok, Thailand draws a large percentage of its visitors when temporary exhibits arrive. The National Museum has partnerships with other institutions around the world from countries like Japan, Mexico, America, France and Korea. Exhibits have been brought in from these partner institutions to provide new experiences for visitors.

Special Speakers

We also recommend that the museum create of a monthly lecture series would also draw repeat visitors. Topics could vary from month to month, and be given by EGAT employees, local Mae Moh residents, energy industry leaders, or
environmentalists. The mining museum, like all museums, should strive to provide more than just a collection of exhibits (AAM, 2006). EGAT employees could provide information about the company’s operations in Mae Moh and throughout the country as well as its plans for the future, which would aid in increasing people’s understanding of the company. Local residents could speak about topics of interest in the area, how EGAT has affected and currently affects life in the region. This would also serve to get the community more involved with the museum and it will teach visitors about the area from a valuable first hand account. The museum could also hire local students as guides or employees as an additional way to get the Mae Moh community involved in the operations of the museum.

Energy industry leaders from other areas would also be able to give lectures and would be able to draw visitors from around the country who are interested in the future of the industry. Environmentalists would offer a great validation to the work EGAT has done towards reclamation, particularly if those who had previously reported EGAT’s practices negatively. This recommendation would serve to truly transform the museum into a respected venue for education and learning.

Periodic Events

We suggest that annual events also be used to bring back visitors on a yearly basis. One such event could be a day where retired employees return, perhaps in period costume, to the museum and speak about the history of the mining processes. Employees could interact with visitors and explain how the old equipment in the outside section of the museum worked. This would serve to provide an educational and entertaining experience.
for visitors, as well as to increase awareness about the outdoor exhibit. The museum should also be incorporated into other annual events EGAT holds in the Mae Moh region, such as the marathon and flower festival. The museum could be advertised at the events, and calendars of upcoming museum events could be handed out when visitors leave the museum.

**Membership Program**

We also suggest the museum consider the development of a formal membership program. The director of the King Prajadhipok Museum in Bangkok said that one of the most effective tools they use to maintain visitor retention is a membership program. Through this program visitors are informed of upcoming events through the use of mailings or email. Members can also be given cards and exclusive T-Shirts. The King Prajadhipok Museum offers annual memberships as well as lifetime memberships. The director of the King Prajadhipok Museum indicated that the exclusive and complimentary T-Shirt is a big draw for membership. The director stated that the most important reason to maintain a membership program is to publicize the museum because members often refer friends and family to come to the museum and see a new exhibition or program.

**5.2.5 Creating a Website**

In order to reach a wide audience, we recommend the creation of an English-language website. As discussed in the findings section regarding visitors opinions changing, it is possible that EGAT is not attracting the target audience whose opinions EGAT would like to change. As discussed previously, the majority of the visitors came
to the museum with a positive opinion of the museum. It is important for the museum to reach a more critical audience, particularly press and environmental groups, with EGAT’s message of reclamation and environmental conservation. To do this they must make the museum’s valuable information more accessible to the public. As discussed in the findings chapter, there is currently a Thai website, but creating an English website for the museum would allow EGAT to attract a wider audience. An English website would appeal to international environmental organizations who are most likely more familiar with English (Payap, Interview, January 26, 2007). The website could be a single page listing current events occurring in the museum, some information on the primary exhibits, and the museum’s contact information. This form of publicity will help the museum to present accurate data about the museum and EGAT’s improvement plans for the Mae Moh area.

A formal interview with the Deputy Governor of Fuel revealed that he would like to see the museum’s information available to those who are not able to visit Mae Moh by creating a website. When officials were asked what they thought about a museum website many were concerned that it would take too long for the page to appear, so it would be most effective to have a quickly loading site. This can be easily accomplished by keeping the number of pictures minimal and having concisely worded text. A long-term plan for the area is to attract individual tourists who are not part of a large tour group. An effective website could draw in these visitors who are looking for entertainment in Northern Thailand as the lignite mine is reclaimed and turned into a tourist and recreation area.
5.3 Summary

These recommendations are designed to further attain the objectives stated by EGAT officials and museum developers. They consist of suggestions that address current shortcomings in the museum’s operation that adversely affect its ability to draw and educate visitors. It is important that the museum improves on specific objectives, such as honoring King Rama VII, educating visitors about environmental management techniques and conservation, as well as informing visitors of reclamation plans, before the Princess’ visit in June 2007. Further changes to the museum’s operation will require more research and planning, but these changes should be implemented to ensure that the museum is operating at its fullest potential.
6.0 CONCLUSIONS

The King Rama VII Mining Museum has a powerful opportunity to be an educational resource for the public. It is located at the site of EGAT’s lignite mine and power generation facility that is trying to change its negative image by presenting factual information about mining, power generation, and the utility’s environmental improvement practices. The goals of our project were to evaluate the current operations of the mining museum, assess if it is meeting the objectives set by EGAT officials and museum developers, and to provide feedback and improvement ideas for the future success of the museum.

Our research has verified that the King Rama VII Mining Museum is meeting most of its objectives; improvements must, however, be made to ensure the exhibits that directly pertain to the museum’s objectives are presenting factual information needed to educate, not simply entertain. Our short-term recommendations focus primarily on improving the museum’s current initiatives and exhibits. By adding more text and artifacts to the King Rama VII room, visitors will be more informed about his life and the contributions he made to Thailand.

Improving the sulfur dioxide exhibit with more scientific, historical, and comparative information will allow visitors to develop their own conclusions about EGAT Mae Moh and the work that the utility has done to lower emissions and improve the environment and health for the local residents. Our findings also support the need for an energy conservation exhibit, which can teach visitors about the public’s responsibility to conserve natural resources by using less energy. The effectiveness of these environmental exhibits is very important if the museum wishes to see the more critical
visitors leave with an improved image of EGAT and their mining and power generation practices.

Other recommendations that would result in significant infrastructure changes, like stopping the use of guided tours for the museum, bringing in special speakers or events, and creating a membership program, can be implemented on a long-term basis once more research has been conducted.

The museum has only been open for a year and a half and in that time it has brought in over 80,000 visitors, far surpassing EGAT’s initial goal of 10,000 annual visitors. Questionnaire responses and interviews indicated that visitors wish to return to the museum and that the museum is providing an enjoyable experience.

EGAT has made great strides in improving its environmental practices, and it is imperative that the museum demonstrate the good works they have done. The energy the mine and power plant at Mae Moh generate is an integral part of Northern Thais’ way of life, and the museum must serve as a way to show the area’s importance to visitors, while simultaneously displaying factual information relating to the environmental and health effects of power generation.
7. REFERENCES


“What is a Museum.” https://aamweb.aam-us.org/aboutmuseums/whatis.cfm

White, Paul “CSM Staff” (1998), Retrived November 21, 2006 http://www.cems.uwe.ac.uk/~pwhite/SURVEY1/node27.html


Appendix (A1): Interview Questions

EGAT Officials

Originators of the museum concept
Leaders of the corporation
A member of the board of directors

1. Why do you believe EGAT decided to create and sponsor the museum?
2. Why did you feel it was necessary to create the museum?
3. What was your role in the conception of the museum?
4. What were the primary objectives of the museum?
5. Who do you feel is the target audience for the museum?
6. Does the museum bring tourism to the region? What information leads you to this opinion?
7. What is the most important information that the museum currently conveys?
8. What do you think the museum provides for the community and visitors?
9. Do you believe that the visitors view of EGAT and the mine/region changes after visiting the museum? What information leads you to this opinion?
10. Is the museum meeting its expectations? Why / Why Not?
11. Is there anything you feel should be added to the museum? What?
12. What if any improvements would you like to see made to the museum?
13. Do you think the museum has any responsibility to act as a resource for the local community? Why / Why Not?
14. What does the museum offer the local community?
15. Is the museum doing enough for the local community? If not, what else should be done?
16. Do you feel the museum has been a worthwhile endeavor for EGAT?
Museum Developers

Exhibit Coordinators
Public Relations Officials
Director

1. What positions for employment are available in the museum?
2. What are the responsibilities of the museum’s staff members?
3. Do you interact with other museums? If so, which museums, and how? If not, would you like to?
4. Who do you think is the target audience for the museum? Why?
5. How do you attract your target audience?
6. Is there anything you would like to change about the way you attract visitors?
7. How is the museum advertised?
8. How do local schools use the museum?
9. Would you like the schools to use the museum differently? How?
10. What do you think is the most important information that the museum currently conveys?
11. What is the best information contained in each room of the museum? Why?
12. Is there anything you feel should be changed about the information the museum currently presents?
13. Is there anything else you feel the museum should address? Why?
14. What do you think are the primary objectives of the museum?
15. Do you feel the museum currently meets its objectives? Why or why not?
16. What techniques do you use to evaluate the museum?
Local Officials

Mae Moh government leaders

1. Have you visited the museum? Alone or with a group?
2. Is there a particular reason why you have or have not visited the museum?
3. Did you enjoy the time you spent there? Why or why not?
4. What did you learn from visiting the museum?
5. What was your favorite aspect of the museum?
6. Do you think you will visit on a regular basis? Why or why not?
7. What do you see as the primary objectives of the museum?
8. Who do you feel is the target audience for the museum?
9. What is the most important information that the museum currently conveys?
   About King Rama VII? About Geology? About the mining process? About old power generation machines? About EGAT’s environmental improvement plans?
10. What is the community’s reaction towards the museum?
11. Do you believe visitors to the region have the same reaction? Why or why not?
12. Do you think the museum is a positive addition to the community?
13. Have you noticed an increase in tourism since the museum’s completion?
14. Are there any exhibits or displays you would like to see added to the museum?
15. Are there any subjects you would like to see added to the museum?
16. Are there any services or community based activities you would like the museum add to its program? If so, what?
Villagers

Those who have visited the museum
Those who have not visited

Town Meetings

1. Have you visited the museum? Alone or with a group?
2. Is there a particular reason why you have or have not visited the museum?
3. Did you enjoy the time you spent there? Why or why not?
4. What did you learn from visiting the museum?
5. What was your favorite aspect of the museum?
6. Do you think you will visit on a regular basis? Why or why not?
7. What do you see as the primary objectives of the museum?
8. Who do you feel is the target audience for the museum?
9. What is the most important information that the museum currently conveys?
   About King Rama VII? About Geology? About the mining process? About old power generation machines? About EGAT’s environmental improvement plans?
10. What is the community’s and your reaction towards the museum?
11. Do you think the museum is a positive addition to the community?
12. Have you noticed an increase in tourism since the museum’s completion?
13. Are there any exhibits or displays you would like to see added to the museum?
14. Are there any subjects you would like to see added to the museum?
15. Are there any services or community based activities you would like the museum add to its program? If so, what?
Older Students

High School
Middle School

1. Have you visited the museum? Why or why not?
2. Did you or would you attend? Alone? With school? With family?
3. Why did you visit the museum?
4. What did you learn from visiting the museum?
5. Did you enjoy the time you spent there?
6. What was your favorite aspect of the museum?
7. You would like to see the museum improved?
8. What would you like to see added to the museum?
Appendix (A2) : Questionnaire (Copy with Translations)

Questionnaire

1) Where are you from ...............................................................

2) What Type of Group are you with?
   1) Primary School               2) Government Agency 
   3) High School                  4) Community Group   
   5) University                   6) Private Company  
                                   7) Other............... 

3) Have you ever been to Mae Moh Mine before?
   1) Yes                          2) No 

4) Have you ever heard of Mae Moh Mine before?
   1) Yes                          2) No 

5) Where did you hear about the mining museum?
   1) News Paper                   6) Colleague 
   2) TV                          7) Teacher/School 
   3) Radio                      8) Activities by EGAT 
   4) Friend                    9) Website 
   5) Family                    10) Other 

6) What was your favorite exhibit?
   1) Rama 7 Room                  4) Power Plant Room 
   2) Mine Pit                    5) Environmental Exhibits 
   3) Dinosaurs                  6) Community 

7) Would you want to come back to the museum?
Make sure that entire questions and the response options are on the same page – just as hopefully they were in the actual questionnaire

1) Yes 2) No

8) Would you recommend the museum to a friend?

1) Yes 2) No

9) What was your opinion of EGAT before your visit to the museum?
   (One being the worst and five being the best)
   Bad 1  2  3  4  5 Good

10) What was your opinion of EGAT after your visit to the museum?
   (One being the worst and five being the best)
   Bad 1  2  3  4  5 Good

11) Do you have any comments for the museum?

Questionnaire Thai
### Appendix (A3): Questionnaire Data

<table>
<thead>
<tr>
<th>Question 2: What type of group are you with?</th>
<th>Primary School</th>
<th>Primary School</th>
<th>High School</th>
<th>University</th>
<th>Community</th>
<th>Museum</th>
<th>Other</th>
</tr>
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<th>Question 7: Would you ever come back to see the museum?</th>
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<td>Question 10: What is your opinion of EGAT sense visiting the museum?</td>
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Started 4 Stayed 4 stayed the same 44

12 Changed opinion 33

Started 3 Stayed 3
9

Started 2 Stayed 2
1

Started 1 Stayed 1
1
Appendix (A4): Daily Interpretive Analysis

**Interviewee:** Khun Pairot  
**Characteristics of Interviewee:** 60s, creator of the geology room in the museum

**Analysis of Findings:**  
*What are the objectives of the museum?*  
The museum should teach visitors about mining and what EGAT has done for the environment, as well as show the reclamation process for the land.  
*Who is the target audience of the museum?*  
The museum seeks to reach all ages. The museum is unique to Thailand because many visitors have never seen a power plant or mine because mining is not common in Thailand.  
*What changes would you like to see made to the museum?*  
He would like to see things added to the museum and he is willing and eager to listen to visitor’s suggestions. Since the museum is so new, they have not considered making extensive improvements yet. They are going to look into improvements once the museum is formally dedicated by the princess. He recognized that the museum groups tend to get clogged as they walk through the small exhibit halls and he would like to see this improved.  

**General Information**  
There are 2 permanent staff for the museum and 7 total employees. The admission to the museum is free. It generally takes one hour for visitors to go through the museum and this is generally the amount of time that tour groups allot to visiting the museum. The museum is aware the there is not much text, but it is their objective to promote feeling and not information. Most people seem to be happy with the content of the museum. The museum is currently on the reclamation land from the early mining.

**Conclusions:**

**Concerns from the Study:** Why are changes not being considered now, are they seeking to fix the clogging of the tour groups, or just let it happen?

**Time:** 11:00 AM  
**Date:** 1/26/2007  
**Location:** Museum Cafe  
**Team Members Present:** Morgan Carpenter, Paul DellaVilla, Chris Andrews, Lauren Olver  
**Author:** Morgan Carpenter
Daily Interpretive Analysis

Interviewee: Khun Nampon

Characteristics of Interviewee: Khun Nampon is an EGAT official, middle aged (40ish), involved in the creation of the Rama VII room. He was head of PR at time of development and is currently head of Dept of Land Lease and Rights.

Analysis of Findings:

What are the objectives of the museum?

The museum should create understanding in the community. Environmental problems caused a loss of trust, and although environmental improvements occurred it is hard to regain trust. It is also difficult for people to understand technical methods of improvement so important to educate and entertain. He wants the museum to provide area to display culture and products of local people.

Who is the target audience of the museum?

Primary audience is students and people in Mae Moh. Locals are the most important, but tourists are needed to provide benefits to locals and to help change the opinions the media gives them.

What changes would you like to see made to the museum?

Considers museum 80% effective, doesn’t yet have good market. Wants temporary exhibits on things currently important (i.e. exhibit on earthquakes following quake in Chiang Mai). King Rama VII room needs improvement with more artifacts, more like Bangkok museum. Would like a website, but needs to be fast, not governmental.

What are the most important exhibits in the museum?

The most important exhibits are geology and monitors.

General Information

There are 2 permanent staff for the museum and 7 total employees. The admission to the museum is free. It generally takes one hour for visitors to go though the museum and this is generally the amount of time that tour groups allot to visiting the museum. The museum is aware the there is not much text, but it is their objective to promote feeling and not information. Most people seem to be happy with the content of the museum.

The museum is currently on the reclamation land from the early mining. researched Chiang Rai, Bangkok, Kanchanaburi and Chantaburi. Looked at problems these museums faced and tried to figure out ways to avoid. Wanted museum to be very hands on. Wants people to see whole museum, not just inside, so need more time. Primary method of advertisement was initially word of mouth, people coming to see the power plant and mine would stop at museum. Coordinated with Bangkok PR office to get on 10+ TV programs. Lots of school trips, up to teachers to give projects and worksheets. Most local children have seen the museum. Want local students to become involved with the museum with special projects or helping with tours.

Egat is building a hotel by the lake, maybe set up golf/museum package for families. Most people just come to see the museum, don’t golf. Provides 5 small buildings for OTOP (one tambon, one product), would like more. People
don’t usually have time to shop, move OTOP to hotel after built? Currently evaluates museum by asking for suggestions and looking at guestbook. Pays particular attention to VIP groups. Wants us to provide outside opinion, look at other museums, provide suggestions. Wants a “living” museum.

**Conclusions:** Target audience of the museum is primarily locals-less focus on outside tourism than other officials. Seems very focused on community opinions. Would like to expand Rama VII room, have more traveling exhibits. Has plan for future expansion, such as hotel/golf package. Would like to see average time spent at museum increase to include surrounding area/shops.

**Concerns from the Study:** Tourists less important?

**Time:** 10:00 AM  
**Date:** 1/26/2007  
**Location:** Office  
**Team Members Present:** Morgan Carpenter, Chris Andrews, Lauren Olver, Paul DellaVilla  
**Author:** Lauren Olver
Daily Interpretive Analysis

Interviewee: Khun Payap

Characteristics of Interviewee: 60s, EGAT executive

Analysis of Findings:

What are the objectives of the museum?
The primary reason for creating the museum is to honor King Rama VII for making his national decree for the preservation of the coal in Mae Moh. The museum would also like to commemorate his life and journey to the north. The museum should also show that EGAT is working to improve the environment.

Who is the target audience of the museum?
EGAT would like to bring tourists to the region.

What changes would you like to see made to the museum?
Some ideas for improvements include: welcoming visitors, increase hours of operation, improve the technology of presentations, and improve the community relations. It would also be beneficial to tell the facts to those who cannot come to Mae Moh. According to Payap, the museum is currently meeting the outset expectations.

What are the most important exhibits in the museum?
The museum also displays old equipment, geology, power plants, and the environmental conservation in the area. There is a major focus on the reclamation that is occurring in the area.

General Information
So far, EGAT has given 500 million baht to the Mae Moh area, which is the equivalent of 12 million USD. EGAT is hoping to turn this area into a visitor center and recreation destination. The reclamation is focusing on forestry, water storage, agriculture, and recreation. In the past, EGAT has recognized its mistakes and has fixed them, but only their impacts have been reported. When there was too much production, resulting in pollution, they slowed production, installed scrubbers, and closed down the first three stacks.

EGAT takes care of the environment. The bank that they borrow money from will not let them take out more if they are not meeting the environmental standards set by the government.

The world coal seminar was hosted in Lampang Jan/Feb of 2006. This shows a lot because they would not host this seminar in an area of high pollution and local suffering.

Conclusions: From this interview, we have found that the museum’s purpose according to Khun Payap is to show the public what EGAT has done and that they are not harmful to the environment. They are benefiting the local community through their plans of reclamation.

Concerns from the Study: He is very concerned with EGAT’s relations with Greenpeace. He would like us to primarily resolve relations with them and the press which has been reporting the area negatively.

Time: 11:00 AM
Date: 1/26/2007
Location: Khun Payap’s Office
Team Members Present: Morgan Carpenter, Paul DellaVilla
Author: Morgan Carpenter
Daily Interpretive Analysis

Interviewee: Mr. Pramote

Characteristics of Interviewee: Assistant Director of Administration and Technology. He has worked at EGAT in Mae Moh for 27 years.

Analysis of Findings:
What are the objectives of the museum?
The reason he felt the museum was created was to improve the public image of EGAT in Mae Moh. He also felt the museum should be used as a mining/geology technology study center to educate the public.

Who is the target audience of the museum?
Students and teachers from around Thailand are the target audience.

What changes would you like to see made to the museum?
One of his major goals is to have temporary exhibits that focus on major issues that are happening around Thailand (for example have an exhibit about the tsunami after it happened).

What are the most important exhibits in the museum?
The most important part of the museum to him is the environmental education area.

General Information
He was a member of the original museum creation team.

Conclusions:

Concerns from Study:

Time: 3:00
Date: 1/29/07
Location: Office
Team Members Present: Paul and Lauren
Author: Paul
Daily Interpretive Analysis

Interviewee: Khun Goonchalee

Characteristics of Interviewee: EGAT official, middle aged (40ish), involved in the oversight of the museum. Is currently the chief of general services department. The museum used to be in charge of the plans of the museum, but when her boss retired, it moved under Khun Kietisan’s command.

Analysis of Findings:

What are the objectives of the museum?

The primary objective of the museum is to give credit to King rama 7 for allocating coal for government use. Secondary objective is to teach local people the process of mining coal and power generation. Third, to develop area for tourists 40 years from now.

Who is the target audience of the museum?

There was a plan for a traveling exhibit to be displayed to the right as you walk into the museum, again this may have been lost with the transfer of power.

What changes would you like to see made to the museum?

What are the most important exhibits in the museum?

General Information
.Khun Chuyoos is the “boss” of the museum project now.

She had planned 2 exhibitions for the museum but after the transfer of power, it is no longer her job. Everyone who comes to the sporting events, they put on a bus and bring them to the museum. This and television programs seem to be their main method of advertising. They planned the museum to be very small, 5 million baht at first, they soon redrew the plans for a 71 million baht project it currently is. Before the museum was built everyone who visited the region toured the mine and the power plant. With the creation of the museum, there is now a place to show people all aspects of EGAT life. They advertise to tourist groups that bring the busses there. It is too early to tell what expectations for the museum will be. She hopes that people will come and see for themselves the beauty of the region.

Conclusions: during the transfer from her old boss to the new one, there were many projects she had planned that we have not heard anything about suggesting they may have been lost or held up during the move.

The advertising to tour groups needs to be helped if they would like to spend a little more time in the museum.

Concerns from the Study: many great project ideas are no longer her responsibility. We hope to find out to whom they belong soon.

Time: 0900
Date: 2/01/2007
Location: Office
Team Members Present: Paul, Chris
Author: Chris
Daily Interpretive Analysis

Interviewee: Khun Kiertisan
Characteristics of Interviewee: 60s Director of Fuel

Analysis of Findings:

What are the objectives of the museum?
The purpose of the museum is to provide education and entertainment to visitors. From his personal opinion the people visiting the museum must be able to understand and recognize the value of energy, the difficulty of getting coal, and they must also understand the environmental impact that coal burning has on the environment. After visiting the museum visitors should recognize that EGAT can and does control the pollution that comes from the plant. He would also like people to understand that EGAT provides a higher quality of life for the people of Thailand. He would like to change the attitude of the Thai people.

Who is the target audience of the museum?
The target audience for the museum is the Thai people

What changes would you like to see made to the museum?
He thinks that a website would be effective. One means of improvement would be to suggest that visitors spend more time at the museum and perhaps see presenters who are more knowledgeable about the production and mining.

What are the most important exhibits in the museum?

General Information
The museum was created by the Public Relations department. So far, he believes that the museum is doing well, but he doesn’t know the specific degree of satisfaction of the people who have visited. Ads have been put on the radio and some have been put in newspapers to advertise the museum. The ads promote the museum as a tourist attraction within Lampang.

Conclusions: Khun Kiertisan suggested the creation of a conservation exhibit before we even brought it up and he also thinks that a website would be an effective means of presenting information about the museum and EGAT in Mae Moh. This could be another source to change the attitudes of the Thai people, which is the primary purpose of the museum.

Concerns from the Study: He doesn’t have much interest or knowledge about having a traveling exhibit for the museum.

Time: 10:30 AM
Date: 2/5/2007
Location: Khun Kiertisan’s Conference Room
Team Members Present: Morgan Carpenter, Christopher Andrews
Author: Morgan Carpenter
Daily Interpretive Analysis

Interviewee: Khun Chooyos

Characteristics of Interviewee: EGAT official that initially suggested creation of a museum. Director of Mae Moh Mine production

Analysis of Findings:

What are the objectives of the museum?
The museum should bring visitors to the region to prove that EGAT is working to change the environmental problems.

Who is the target audience of the museum?
Tourists.

What changes would you like to see made to the museum?
Wants the museum to show the technology used in mining, doesn’t see the need for any changes other than reflecting changes made when the mining process changes. Would like to see the 3D movie changed occasionally so return visitors won’t get bored. Would like to see another building constructed to hold fossils found in mine—a second, bigger building would give people more to see when they come to visit.

What are the most important exhibits in the museum?
Exhibits that show mining process and environmental exhibits are the most important.

General Information

Conclusions: Does not seem to want anything other than small cosmetic changes in current museum. Would eventually like to see museum expanded.

Concerns from the Study: Does not want to see any changes, so probably won’t agree with suggestions we make.

Time: 1:30 PM
Date: 2/5/2007
Location: His Office
Team Members Present: Paul, Lauren
Author: Paul
Daily Interpretive Analysis

Interviewee: Wiboonsak

Characteristics of Interviewee: head of workshop division at EGAT. Involved with the initial creation of the museum, specialized in the museum’s operations (sound/lights/motion sensors). Head of the political department at the time.

Analysis of Findings:

*What are the objectives of the museum?*
Wants people to know how lignite is formed and how power plant works and how to control environmental problems.

*Who is the target audience of the museum?*
Students are the target audience.

*What changes would you like to see made to the museum?*
Would like environmental section expanded. Would like to see an exhibit on how Thai people can save energy-if visitors know how energy is produced, they should know how to save it. Would like to improve Rama VII room, but likes the fact that the room showcases the mine. Would like a website.

*What are the most important exhibits in the museum?*

General Information

Conclusions: No new ideas, likes all current ideas

Concerns from the Study:

Time: 10:00 AM
Date: 2/5/2007
Location: M.5
Team Members Present: all
Author: Lauren
Daily Interpretive Analysis

Interviewee: Khun Paiboon

Characteristics of Interviewee: responsible for operation side of museum.

Analysis of Findings:

What are the objectives of the museum?

Museum was created so people would visit Mae Moh and see that there was no pollution and better understand EGAT’s practices. Wants people to see how lignite is used.

What changes would you like to see made to the museum?

Thinks the museum is small and should have more information on the process. Likes idea of website because more and more people are becoming familiar with IT. Feels most Thai people don’t know about conservation, agrees that an exhibit would be good. Would like to see more education/information in geology exhibit, would like models in power plant exhibit to move. Would like to expand the environmental section.

General Information

Conclusions:

Concerns from the Study:

Time: 10:00 AM
Date: 2/5/2007
Location: M.5
Team Members Present: all
Author: Morgan
Daily Interpretive Analysis

Interviewee: Khun Boontien

Characteristics of Interviewee: Helped with the concept of the Environmental Management and Power Plant sections.

Analysis of Findings:

What are the objectives of the museum?
The museum should return knowledge to the community, as well as tourists.

Who is the target audience of the museum?
Local residents and tourists are both target audiences.

What changes would you like to see made to the museum?
Would like to interact more with local residents and improve the communications systems in the environmental area—the data is often incorrect and hard to interpret.

General Information

Doesn’t see any obvious financial benefits for the area from the museum.

Conclusions:

Concerns from the Study:

Time: 3:30 PM
Date: 2/8/2007
Location: M.5
Team Members Present: Lauren Olver, Chris Andrews
Author: Lauren Olver
Daily Interpretive Analysis

Interviewee: Khun Ponlit
Characteristics of Interviewee: Assistant Deputy of Power Plant

Analysis of Findings:

What are the objectives of the museum?
To show tourists and students that FGDs are working. Also, to honor King Rama VII.

Who is the target audience of the museum?
Tourists and students are the target audience.

What changes would you like to see made to the museum?
The museum should show EGAT activities, more about the community. Show how EGAT has helped the community (vocational activities, infrastructure like water and roads). Thinks it will be difficult to expand and improve.

General Information
Air is 7x better than that in Bangkok

Conclusions: Nothing really new, wants to show what EGAT has done for the community, not really what the community is like.

Concerns from the Study: None

Time: 9:00 AM
Date: 2/9/2006
Location: Museum
Team Members Present: All
Author: Lauren
Daily Interpretive Analysis

Interviewee: Khun Damrong

Characteristics of Interviewee: Involved in the conceptualization of the mining exhibit. Senior engineer in Planning and Administration.

Analysis of Findings:
What are the objectives of the museum?
The two key purposes of the museum are to educate visitors about mining and to increase tourism and demonstrate the environmental initiatives taken to the press.

Who is the target audience of the museum?
The museum should begin with targeting local students, then expand to the entire country.

What changes would you like to see made to the museum?
The movie is the most interesting, but too complicated. He also wants more about how Mae Moh contributes to EGAT as a whole. Would like to see the exhibits updated.

General Information
Conclusions:

Concerns from the Study:

Time: 2:30 PM
Date: 2/13/2007
Location: M.5
Team Members Present: All
Author: Lauren
Daily Interpretive Analysis

Interviewee: Khun Dumkeang

Characteristics of Interviewee: Creator of the Old Equipment Exhibit

Analysis of Findings:

What are the objectives of the museum?
    He believes that the primary purpose of the museum is to serve as part of EGAT’s tourist attractions to the region.

Who is the target audience of the museum?
    He also thinks that tourists should come to the region to see the environmental improvements.

What changes would you like to see made to the museum?
    He would like the museum to show more about the local area and community. He would also like the museum to contain some of the old equipment to make it more like the Smithsonian.

General Information
    His favorite part was the three dimensional movie.

Conclusions:

Concerns from the Study:

Time: 1:30 PM
Date: 2/8/2007
Location: Our Office
Team Members Present: All
Author: Morgan Carpenter
Daily Interpretive Analysis

Interviewee: Khun Viwat

Characteristics of Interviewee: Curator of King Rama VII Mining Museum

Analysis of Findings:

What are the objectives of the museum?
Two main reasons: to honor King Rama VII and wanted to return knowledge to local area.

Who is the target audience of the museum?

What changes would you like to see made to the museum?
He would like to change last room before souvenir room to emphasize importance of coal, and that lignite is a good, cheap fuel. Would like to occasionally change movie and era models. Thinks that groups are too big.

What are the most important exhibits in the museum?

General Information
Are there any plans for traveling exhibits? Have visited Sci museum and King Rama VII museum in Bangkok, but difficult to set up in limited space. Maybe do exhibits outside.

What about the areas set up outside for people to sell products? Most tours are students, and it wasn’t worth it for the locals to come sell things daily. They come for special events and on holidays when there are more tourists.

Conclusions: Community oriented, wants changes, liked proposed ideas.

Concerns from the Study: If locals wont sell daily, what to use kiosks for

Time: 9:00 AM
Date: 2/9/2006
Location: Museum
Team Members Present: All
Author: Lauren
Daily Interpretive Analysis

Interviewee: Local Town Officials

Characteristics of Interviewee: 40s, 40s, 60s
Deputy Chief of the Local District, Member of Local Administration, Mae Moh Tour Guide

QUESTIONS ANWERED:

- Are the objectives being met?
Her favorite exhibit was the description of how coal evolves after it is taken from the mine. She thinks that the environmental exhibit is okay but it needs to be explained better so that locals know what information is being portrayed. For the community, the museum serves as a tourist attraction as well as a learning center for the local youth.

Her favorite part of the museum was the history of the Mae Moh Mine and how it was discovered and how it is mined. It also serves to change the negative opinions of visitors. EGAT and the environment

He thinks that the museum serves to teach the local community and also shows visitors what Mae Moh has to offer. He thinks that the museum encourages the local community to participate and the museum also increases tourism to the region. Previously, the locals didn’t know about the pollution, but now, there is more information available to the people.

- And, what can be done to improve the museum?
She would like the pathways in the museum to be improved because they are not safe for the elderly.

The environmental exhibit has limited space and they should look into extending it. The content is okay but the senior citizens who visit the museum cannot understand it. She would like to see an air quality chart that tracks SO2 over a period of time. She thinks that changes should be made to the 3D movie, it should be updated, more info needs to be put into the king Rama room, and more information needs to be included about the Mae Moh people and their history.

Additions to the museum could include; more about the life in Mae Moh before and after the mining and he would like to show how the locals contribute to EGAT.
Analysis of Findings: All three of the interviewees had visited the museum.

1. She liked the museum. She learned about geology and fossils. In rural areas like Mae Moh, they don’t have museum and learning centers like this. The museum presents information to the people and makes her proud. Her favorite exhibit was the description of how coal evolves after it is taken from the mine. She thinks that the environmental exhibit is okay but it needs to be explained better so that locals know what information is being portrayed. For the community, the museum serves as a tourist attraction as well as a learning center for the local youth. Compared to the past, there has been some improvement with the local environment. She would like EGAT to monitor their environmental impact more seriously and she would like to see some follow through with the plans that they present to the people. She is still concerned with the locals feelings towards EGAT. She would like the pathways in the museum to be improved because they are not safe for the elderly.

2. She was excited to visit the museum and she learned new things. It is a knowledge center for children and it has brought a reputation to the area because of the fossils that they display there. Her favorite part of the museum was the history of the Mae Moh Mine and how it was discovered and how it is mined. The environmental exhibit has limited space and they should look into extending it. The content is okay but the senior citizens who visit the museum cannot understand it. For the community, the museum provides tourism along with the activities the EGAt already sponsors. It also serves to change the negative opinions of visitors. EGAT and the environment: Some improvements have been made but EGAT needs to show more commitment to their environmental monitoring and she would like to see an air quality chart that tracks SO2 over a period of time. She thinks that changes should be made to the 3D movie, it should be updated, more info needs to be put into the king Rama room, and more information needs to be included about the Mae Moh people and their history.

3. He thinks that the museum serves to teach the local community and also shows visitors what Mae Moh has to offer. He thinks that the museum encourages the local community to participate and the museum also increases tourism to the region. Previously, the locals didn’t know about the pollution, but now, there is more information available to the people. EGAt has better control and the green belt of trees that they have planted has helped minimize their environmental impact especially the noise and dust. Additions to the museum could include; more about the life in Mae Moh before and after the mining and he would like to show how the locals contribute to EGAT.

Time: 2:30 AM
Date: 2/8/2007
Location: Café Downstairs
Team Members Present: All
Author: Morgan Carpenter
QUESTIONS ANWERED:

- Are the objectives being met?
  Would like to come back with family.

Daily Interpretive Analysis
January 24, 2006

Focus Group 1
Characteristics of Interviewee: 12 and 13 M, on school trip

Analysis of Findings: They had heard of EGAT before, with a positive image. Heard of it from the teacher, liked 3-d movie best. Would like to come back with family. First time to the museum

Conclusions: Although they had a positive image before the visit, they enjoyed the museum overall enough to recommend it to family and friends.

Concerns from the Study: kids will like the movie, if we ask them solely what their favourite section is, movie may be only response.

Time: 10:30 AM
Date: 1/25/2006
Location: Museum
Team Members Present: Chris Andrews and Lauren Olver
Author: Lauren Olver
QUESTIONS ANSWERED:

- Are the objectives being met?

Feels that with more knowledge comes a more positive image of the company.

Focus Group 2
Characteristics of Interviewee: 64f, 75m, 69m,

Analysis of Findings: came from nearby villages, first time they had been to the museum. Heard of pollution for many years, smelled a bad smell for many years, it has “recently” improved. Lived here for more than 25 years. Heard of it from college students of area and wanted to see it. Feels that with more knowledge comes a more positive image of the company.

Conclusions: old people give better answers.

Concerns from the Study: I am curious when the smell went away. Also maybe best to interview on person at a time as three people were present but only one person spoke.

Time: 10:45
Date: 1/24/07
Location: Museum
Team Members Present: Chris Andrews and Lauren Olver
Author: Chris Andrews
Focus Group 3
Characteristics of Interviewee: 2 Females, 1 Male, elderly

**QUESTIONS ANSWERED:**
none

Analysis of Findings: Came in a large group from the local village. It was the first time they had visited the museum. They all had very positive images of EGAT but they said that had changed as of late due to the clean up act in the area. They said that many citizens in the area had chronic headaches. The presentation that the 3 seemed to like the best was the 3D presentation.

Conclusions: This was a very informative and helped us reformat our questions and gave us a good example to start from.

Concerns from the Study: We had a random translator and it was hard to get questions across to the subjects. It was also hard to follow the conversation.

Time: 10:45
Date: 1/24/07
Location: Museum
Team Members Present: Paul DellaVilla, Morgan Carpenter
Author: Paul DellaVilla
QUESTIONS ANSWERED:

- **Are the objectives being met?**
  They learned about evolution, mining, the power plant, and King Rama VII from visiting the museum. The museum portrayed a good attitude about the mining and they now no longer think that there is a problem

- **And, what can be done to improve the museum?**
  When asked if Thailand and the Thai people did enough to conserve, they said no. This enforces the need for a conservation exhibit within the museum.

**Interviewee: Environmental Science Students**

**Characteristics of Interviewee:** Three Females, One Male, All 21 yrs
From Ayuttia, 2 Chanburi, Raynong, Spoke fairly good English, they answered the questions

**Analysis of Findings:** The students had heard about the pollution in Mae Moh prior to visiting the region. They had heard about the sulfur dioxide issues. On their visit, they went to see the mine and the power plant. They learned about evolution, mining, the power plant, and King Rama VII from visiting the museum. The museum portrayed a good attitude about the mining and they now no longer think that there is a problem. They were particularly impressed with the mascot for the museum, the 3D movie, and the view from the museum into the mine.

When asked if Thailand and the Thai people did enough to conserve, they said no. They said that the best way to instill this into the people would be through education. This enforces the need for a conservation exhibit within the museum.

The found that there was enough time to visit the museum. They were given about an hour. They would also recommend the museum to friends and they would come back to the museum.

**Time:** 2:00 PM  
**Date:** 1/30/2007  
**Location:** Museum Cafe  
**Team Members Present:** Morgan Carpenter, Chris Andrews  
**Author:** Morgan Carpenter
Interviewee: Environmental Science Students
Characteristics of Interviewee: Four Females, 3 20 yrs, 1 21 yrs

**QUESTIONS ANWERED:**

- *Are the objectives being met?*
  From visiting, they learned about the desulfurization efforts that are occurring here and they also learned more about the mining. The pollution in the area was better than they had though initially.

- *And, what can be done to improve the museum?*
  Some Thais conserve energy and some do not and they think that the best way to improve this would be to educate the people.

**Analysis of Findings:** This was their first time to Mae Moh. Prior to coming, they knew about the sulfur dioxide problems in the area and they still believe that there is a dust problem here. From visiting, they learned about the desulfurization efforts that are occurring here and they also learned more about the mining. The pollution in the area was better than they had though initially. They were most impressed by the 3D animation video that was played at the museum. They believe that Thailand is strict with their environmental standards. They had enough time to view the museum and they would return if they had the time and the money to make it back up to Mae Moh.

Some Thais conserve energy and some do not and they think that the best way to improve this would be to educate the people.

**Time:** 2:15 PM  
**Date:** 1/30/2007  
**Location:** Museum Cafe  
**Team Members Present:** Morgan Carpenter, Chris Andrews  
**Author:** Morgan Carpenter
Appendix (A5) : Floor plan; areas of congestion
Points 1-4 marking congestion areas for tour groups

EGAT Mining and Environmental Room

Geology Room

3D Movie

Era Exhibit

Elephant Exhibit

Geology Room

Mine Pit

Diorama

Power Plant Model

Environmental

[1]

[2] [3] [4]
Appendix (A6) : Floor Plan: Suggested Improvements

King Rama 7 Room and Entranceway

- Addition of information and artifacts in the King Rama 7 Room
- Ineffectively used space
- Addition of Exhibit
- Cubbies or completed computer system
- Adding of benches to the outer areas
- Improve the gift shop

EGAT Mining and Environmental Room

- Addition to the community section
- Ineffective Exhibit
- Creation of Conservation Exhibit
- Improvement to the Environmental Exhibit
Appendix (A7): Souvenir Recommendations

Souvenir Shop

Post Cards

Objective: To present reclamation plans to visitors

Calendars

Objective: To present reclamation plans to visitors