

4.0 EXECUTIVE SUMMARY

The Archaeological Impact Assessment (AIA) is an important component of the Environmental Impact Statement (EIS) as mandated by P.D. 1151 known as the **Philippine Environmental Policy** and Republic Act. 4846, as amended by P.D. 374, otherwise known as “**Cultural Properties Protection and Preservation Act.**” The main rationale for conducting an AIA is to identify possible archaeological resources that may be affected or disturbed during the project development and implementation. In doing so, mitigation and management scheme should be implemented to avoid if not, minimize the damage on these archaeological remains and cultural heritage.

The proposed mining activity of the TVI Canatuan Project is located within the 508 hectares area covered by a Mineral Production Sharing Agreement (MPSA) in Sitio Canatuan, Barangay Tagbayo, Siocon, in the southern part of Zamboanga del Norte.

The archaeological survey conducted by the Archaeological, Cultural, and Environmental Consultancy, Inc. (ACECI) in the areas affected by the TVI Canatuan Project of the TVI Resource Development Philippines, Inc., revealed no visible archaeological resources.

5.0 INTRODUCTION

The Archaeological, Cultural and Environmental Consultancy, Incorporated (ACECI) was established to address the growing needs of both industry and nation for an independent body of specialists capable of initiating studies and assess the impact of industrial projects on the country's archaeological and other cultural resources, and to serve as a reference for regulatory and policy-making organizational bodies.

ACECI was approached by the management of TVI Resource Development Philippines, Inc. to undertake an Archaeological Impact Assessment (AIA) study within a 508.3396 hectare area covered by a Mineral Production Sharing Agreement (MPSA) in Siocon, Zamboanga del Norte (see Figure 1). TVI Pacific, Inc. is a publicly-listed Calgary Canadian-based mining company focused on exploring and producing precious and base metals profitably from district scale-large system, high margin projects located in China and the Philippines.

Benguet Corporation (BC), a Filipino-owned mining firm, obtained the MPSA in 1996, but the following year, transferred its mining rights and interests to TVI, which acquired an Environmental Clearance Certificate (ECC) from the Department of Environmental and Natural Resources (DENR) ten days before the transfer of mineral rights was made.

TVI constructed and operated a small-scale pilot plant on the property (Plate 1B), which processed tailings produced by small-scale miners (SSMs) who were operating on the property. After 1997, industry-wide economic problems and political instability forced TVI to curtail its operations in the area.

Recently, TVI resumed implementation of its project plan, which includes rehabilitating, upgrading and putting into operation its existing plant, expanding the processing of high grade tailings to produce gold and silver core, exploratory activities near the main ore body, and the full-scale mining and processing of significant mineral deposits (www.tvipacific.com).

ACECI sent a team of five specialists to explore and assess the archaeological significance of the affected area. This team was comprised of three professional archaeologists, a scientific illustrator, and a master student from the Archaeological Studies Program, U.P. Diliman.

6.0 SETTING OF THE PROJECT AREA

Description of the Project Area

The project area consists of some 508 hectares in Sitio Canatuan, Barangay Tagbayo, Siocon, in the southern part of Zamboanga del Norte, approximately 800 kilometers south of Manila (see Figure 2). The municipality of Siocon is composed of 26 barangays and has a total land area of 50,320 hectares. Roughly eighty percent or 31,669.63 hectares of this is made up of forested land. Barangay Tagbayo covers 1,935.50 hectares.

Siocon's topography is typical of the province's hilly and mountainous character. It hosts one of two proclaimed watershed areas in the province comprising 612 hectares. Now however, the total forest and watershed area of 32,605 hectares has been stripped of dipterocarp trees due to logging operations by forest concessionaires.

As in the rest of the province, Siocon enjoys generally good weather with even rainfall all year round, and no pronounced wet or dry season. It lies outside the typhoon belt and thus, rarely experiences winds above 50 kilometers per hour.

Siocon, along with Sindangan and Liloy, is one of the major agricultural areas in the province, whose main crops include rice, corn and coconut. Siocon also enjoys abundant marine resources all year round. Its fishing grounds are particularly rich in surgeon fish, parrot fish, tuna, cravella, barracuda, anchovies, indian sardines and a number of other seawater resources. Its deep-water port is considered one of several satellite ports that complement the central seaport in Dipolog City. (www.zamboangadelnorte.gov.ph).

7.0 PREVIOUS ARCHAEOLOGICAL RESEARCHES CONDUCTED IN ZAMBOANGA PENINSULA

H. Otley Beyer (1947:318) wrote that in 1909-1910 Emerson B. Christie, while studying the Subanons, found several Late Neolithic adzes and chisels in use as charms by the medicine men chiefly in the Sindangan Bay. One was badly damaged by subsequent use as a sharpening stone. However, all were clearly plain backed forms of early Late Neolithic types. He further wrote that Age of Contact and Trade sites were found in four principal areas:

a.) The Dapitan-Dipolog area

In 1894, Dr. Jose Rizal, during his exile in Dapitan, and Francisco Sanchez explored the burial caves and land burials of the Dapitan area. Some gold jewelry of the 14th or 15th century AD was excavated on a hill.

In 1906, Emerson B. Christie for the old Division of Ethnology and Philippine Museum examined 18 different caves and burial places at several localities in the Dapitan and Ilaya districts. The collections contained a great variety of materials such as large black burial jars and fragments; iron weapons and tools; objects of copper, bronze, brass, and lead; gold and silver ornaments; and a few beads. Beyer examined the materials and dated these to the 14th and 15th centuries AD. The earliest specimens found were of Yuan date. There were some Sawankhalok and Southeast Asian ceramic pieces but 80% of the materials were of Chinese origin.

The sites reported by Christie were:

1. A small cave on the lower slopes of the hill that rises just north of Dapitan. This contained disintegrated bones.
2. A cave on the lower slopes of the hill called Limanom containing ceramic fragments, jars, as well as skeletal remains and filed teeth.
3. A small cave adjoining No. 2 and the talus slope were both excavated, which yielded additional ceramic materials, broken shell bracelets, metal objects including two arrowheads.
4. A large midden site on top of Limanom hill. Both imported porcelain wares and native pottery were found.
5. A burial cave facing toward Dapitan on Limanom hill.
6. A small burial cave about 20 minutes walk from the Barrio of Ilaya. Ceramic fragments and one cylindrical gold bead were found.
7. A rockshelter, a few meters away from No. 6. This contained bones and pottery.

The natives call the hill where sites No. 6 and 7 were found “**Tapalun**”.

8. A large hill called “**Cataluñgan**”, located about 45 minutes canoe-trip down the river from Ilaya, and 1 ½ to 2 hours climb inland by footpath. This contains several empty caves near the foot of the hill and a large burial cave several meters above the ground in the face of a steep cliff. This cave contained four or five large burial jars with one or more pieces broken out of the sides, and one was half-filled with skeletal remains. Many loose bones were scattered about the floor of the cave. There were at least 50 to 60 burials in this cave. Thirty of the best skulls were collected and shipped to Manila. A great number of stone, shell, and tortoise-shell bracelets were found, and a small round gold ornament and two gold caps for earplugs.

9. An old burial site at a place called “**Marinhit**”, in the Lubungan area, can be reached by banca from Dapitan up the Dicayo River. There was one burial cave at a place called “**Tambay**” on a creek of the same name. Three caves were found in one hill up the Siraan River that flows into the Dicayo. A round gold ornament, considerable numbers of jars and plates, and many shell bracelets were found in one of the Siraan caves.

10. Not less than five old burial places (four were caves and one a rockshelter or shelf in the face of a cliff) were found on the banks of the river above Duhinot and a small tributary. There was a great

number of ceramic fragments found in all of these sites. One jar, ornamented with a dragon design, contained human remains and beads. In one of these caves, a number of large carnelian and agate beads and two gold ornaments were found.

11. At **Manukan**, just beyond Punta Blanca, a medium-sized cave was found. A layer of ceramic fragments with human bones was found.

12. Several caves were heard of some distance up the Disacan or Lisacan River.

13. A cave on the Tangyan branch of the Disacan River was visited.

14. Other caves were heard of in the Langatian subdistrict.

b.) North of Zamboanga City

In the latter part of May 1919, a site in Sitio Manga, Barrio Bolong was accidentally discovered by Pedro and Felipe Tarroza and a certain Rafael de Leon. The site was about 7 km from the seacoast. The burial cave was in a limestone hill with the opening about 30 feet above the surrounding flat land. The cave has two main chambers and has a thick layer of clay soil. The following materials were found in the cave: 3 glazed burial jars, 6 small plates and saucers, 1 bowl, 1 porcelain teapot or water vessel, beads, a piece of flat gold wire about ½ inch wide and a foot long, a number of broken pieces of porcelain and pottery, and several whole and broken shell bracelets. On July 24, 1919, Mr. Juan Posadas, Jr. conducted partial excavation of the same site and found 3 more large jars, 1 small jar, 6 pieces of broken jars, 1 white stone artifact, and 2 pieces of copper or bronze. Most of these specimens were shipped to the Philippine Museum in Manila through Governor Frank W. Carpenter but were later destroyed at the Bureau of Science during World War II. The site is dated late 13th to the early 15th centuries AD. Most of the jars and porcelain pieces are very Early Ming. Three of the jars had incised designs which seemed to be definitely Vietnamese in the 13th or 14th century. A celadon bowl and two small blue-and-white plates are 14th century or beginning 15th century at the latest (Beyer 1947:321-322).

c.) The Sindangan Bay Region

In 1940-1941, Frs. J. Franklin Ewing and Jaime Neri explored a very interesting group of burial caves in the region around Sindangan Bay. Collections were made from four of the caves and shipped to Manila but all were destroyed during the war, including the site records and notes of Fr. Ewing. Beyer (1947:323) wrote that he remembered that the materials collected from the caves consisted chiefly of a large and excellent collection of skeletal remains associated with numerous large fragments of black and dark-brown burial jars. Some porcelain fragments and pieces ranged from the 14th to the 16th century and mainly of Chinese manufacture. Corroded iron weapons and tools and a few miscellaneous objects were also found.

A cave in a sitio called “**Baluk**”, which lay several kilometers inland from Sindangan Bay, was used for burial in the late 15th and early 16th centuries AD. A number of skeletal materials were found associated with 3 flat gold disks with incised designs being caps from the ends of horn or hardwood earplugs, 4 carnelian and 11 glass or paste beads of various sizes and colors, 3 whole and 1 half-whole bronze or copper bracelets, 14 whole shell bracelets, fragments of iron weapons and tools,

pieces of black and brown glazed jar fragments all of Ming types, 1 nearly whole Sawankhalok black-and-white round box probably late 15th or early 16th century type, and 15 pieces of large fragments of Chinese porcelains all of late 15th or early 16th century types.

d.) The Malangas-Margosatubig Region

In 1919, Mr. A.V.H. Hartendorp collected a number of specimens for Beyer around the Margosatubig area. In 1921, Beyer personally collected midden fragments from three different sites near the Malangas coal mines and near where the small mine railroad comes down to the landing pier on the coast. All specimens and field notes were destroyed at 217 Nebraska street during the war (Beyer 1947:323-324).

The first ever recorded archaeological activity conducted by the National Museum of the Philippines in the area of Zamboanga del Norte was done by Alexander Spoehr, Professor of Anthropology from the University of Pittsburgh, in 1969 in Limpapa, Dapitan City. He recovered 13 stoneware vessels and earthenware sherds from the area. The stoneware vessels were attributed by Spoehr as Chinese, Siamese (Thailand), and Anamese (Vietnam) in origin (Ronquillo et.al 1997).

In 1975, the National Museum of the Philippines had a joint undertaking with Enver Enterprise to conduct salvage archaeology in Dapitan City, Zamboanga del Norte (75-H). A 14th century burial site in Maria Uray was looted and local authorities stopped the illegal activities and informed the National Museum. The site is located in Sulangon District, surrounded by navigable swampy water, approximately about 70 to 150 feet above sea level. Maria Uray site had yielded 11 graves associated with Ming Dynasty materials (Alegre 1975).

Alegre (1975) also inspected two more sites while he was in Zamboanga del Norte. One was a disturbed area outside the Catholic Church in the city proper of Dapitan. Two graves and four pieces of Sung artifacts were found in the Church compound. The other site was the Galogo property where three graves and 9 pieces of Sung potteries were found.

In March 1977, it was reported to the National Museum that a megalithic structure was found at Canunan, Dumalinao, Pagadian City, Zamboanga del Sur. The Anthropology Division of the National Museum sent a team for a one-month study and evaluation of the structure. And a reconnaissance geological study was also conducted to verify if the said megaliths are a natural geologic formation or not. The megaliths are actually a natural geologic formation. This natural geologic formation is a columnar structure in basalt or columnar jointing. Most of the columns are four-sided or quadrilateral and others have several sides. The columnar structure was uncovered or exposed when bulldozed by the Philippine Australian Development Assistance Program (PADAP) during the road construction in the area. Some of the columns were broken by the bulldozer and were used as road filling (Peralta, J.T. 1977; Señires and de Ocampo 1977).

The University of San Carlos, the Provincial Government of Zamboanga del Sur, and the National Museum of the Philippines had jointly undertaken an archaeological assessment of Fort Militar (Fort Alfonso XII) from April 18 to May 19, 1994. This was conducted in conjunction with the Summer Field School on Archaeology for Sociology-Anthropology students of the University of San Carlos, Cebu City.

During the Spanish colonial period, the Spaniards recognized the importance of the isthmus of Tukuran, separating the Panguil and Illana Bays. In 1890, the Spanish Governor General Weyler completed a military **trocha** or line of fortified stations named after the members of the Spanish royal family, namely, Fort Cristina, Fort Isabel, and Fort Alfonso. The **trocha** was a narrow path or military trail across the high road and was approximately a 28-kilometer line of defense from Tukuran to Lintogud. These were constructed to shut out the destructive raids of the Moros.

Five historic sites were identified during the course of the Summer Field School, namely: Watch Tower I, Cotta Militar or the Administrative Site Complex, Infirmary Site, Watch Tower II, and a site in the coastal Plain in Sitio Talisay, Barangay Militar. Among the archaeological materials recovered were several medicine bottles; meal discards such as bone fragments and teeth of *BOVIDAE* such as carabao or cow, pig (*Sus sp.*), and chicken (*Gallus gallus*); brackish, freshwater, and marine shells; canon installed north of the watchtower; 16th to 17th centuries AD ceramic sherds; local pottery; metal objects and fragments such as iron nail, screws and an iron or cloth presser; wine bottles and fragments; and coins (Bautista and Peñalosa 1994; Bersales 1994).

An archaeological survey conducted in the Municipality of Sibutad, Zamboanga del Norte in 1977 revealed a negative results to archaeology (Ronquillo et.al. 1997)

8.0 METHODOLOGY AND RESULTS

8.1 Preparations undertaken prior to field activity

Existing information regarding the area of study and its vicinity were reviewed. Specifically, relevant archaeological data in books, journals, manuscripts and other reports were researched at the libraries of the National Museum (Records Section of the Archaeology Division), University of the Philippines and the UP Archaeological Studies Program. This served as a guide on the potential archaeology present in the area. Emphasis was given to previous Archaeological Impact Assessment (AIA) works done in the region.

NAMRIA topographic map sheets 3443 II and 3443 III with a 1:50,000 scale were obtained for this project. Photocopies of more detailed working maps were also acquired for the preliminary assessment of the general topography and boundaries of the area (see Figure 2 & 3).

The equipment, supplies and materials in the archaeological survey included a notebook and laptop computers (Plate 3B), two digital cameras, pocket transit or compass, Magellan portable GPS 310, Munsell color charts, sediment description guide, archaeological kit and archaeological tools. The tools are comprised of mason trowels, folding shovels, 5-meter tape, plastic bags and archaeological forms.

8.2 Field Method

Upon arrival on the site, the survey team examined the maps previously obtained against the actual topography (refer to Plate 1). This was done by going to a relatively high area for a good vista over-looking the general area.

The actual archaeological survey was approached in three ways. The first was informant- based questioning and the showing of sample artifacts in the archaeological kit (Plate 6). The second was field-walking (Plate 5) to examine the presence of archaeological materials on the surface of the survey area. This also involved the observation of vertical profiles that were exposed by several road cuts within the mining area. The third procedure was test- pitting to investigate sub-surface deposits. This method is done in the best possible areas where cultural deposits may be found *in situ*, or the possible catchments where these could collect through soil erosion or other surface movement.

The establishment of stations was done to track the places the team took in making more thorough investigations. Stations are points in the area where using the Global Positioning System (GPS), the north - east coordinates were taken. The more thorough investigations consisted of test pit excavations and the scraping of exposed road cuts (Plate 7 & 8). A total of 19 stations were established covering the 508 hectares of the TVI Resource Development Philippines, Inc. mining company.

8.3 The Survey Results

8.3.1 Informant Interview

The archaeological exploration within the surroundings of the mining sites involved the process of presenting archaeological kit to the local residents in the area, field geologists as well as the engineers and workers of the TVI mining company. An archaeological kit included samples of stone adze, shell adze, blue and white porcelain sherds, fragments of Chinese stoneware jar, obsidian flake tool, and earthenware sherd. The concept behind this process was that if anyone saw any of the type forms in the kit, the chances are, an archaeological site would exist somewhere in the area.

Mr. Sergio Tabden, member of the security group of the mining company have mentioned that blue-and-white and stoneware sherds were observed in Barangay San Jose detachment. This was concurred by Ms. Leni Tolentino of Siocon that blue and white sherds were also noted in Siraway Cave located next to the municipality of Siocon, Zamboanga del Norte. Other informants interviewed were Ronnie Tanggupan and Mitchell Tanggupan both Subanen from Sitio Canatuan, Barangay Tagbayo, Siocon, Zamboanga del Norte revealed that they have never seen any of the type materials in the kit within the mine or its vicinity.

The areas mentioned where the cultural materials were observed by the informants disclosed that the place is far-off from the 508 hectares applied for environmental clearance.

However, ethnographic information gathered from Mr. Arnold Angaris, member of the TVI security group, revealed the Subanon ritual. As explained by the informant that every seven (7) years, a Subanon gathering locally known as *Buklog* was celebrated in order to fulfill its promises or "*panaad*." This ritual is celebrated for seven (7) days by its high priest known as "*timway*" or "*bugalan*", which involve the use of pottery vessels commonly called *tibod*. This pottery vessel is in various sizes and shape, which is passed from one generation to another, and purposely buried underneath the ground. The ritual involved dancing and stomping of feet in a huge dancing platform to which a log is attached that hits a hollowed sounding board on the ground. This hollowed sounding board utilizes the buried jars that produce sound which can be heard from other neighboring areas of Siocon. The latest celebration was done in Sitio Litoban, Barangay Tabayo on December 7, 2003.

8.3.2 Results of Surface Survey

In the conduct of the open site survey, the team first determined the location of the project area in map (Plate 4) to ensure that the areas to be investigated can be plotted on the map. The Magellan 310 Global Positioning System (GPS), a compass, NAMRIA topographic map (Sheet No. 3443 II and 3443 III; scale 1:50,000 meters) and a working map (scale of 1:6,000 meters) provided for by the TVI Pacific Inc. were utilized for this purpose (see Figure 3).

A substantial surface survey of the Mining Area was done. The team started its archaeological exploration from the highest level or peak of the quarry area or mine site and walked towards the Canatuan creek. Surface survey follows the contour of the area rather than road cuts – observing the surface of the slopes for cultural materials in the process. There were areas surveyed within the applied boundaries of the mine site that were already disturbed by small-scale miners. Sinkholes made by these small-scale miners were left unattended and uncovered which hampers the process of foot survey for possible recovery of archaeological materials. At present, the operations of these small-scale miners were stopped because of the strict militarization in the mining area. Detachments of the company's security group operating within the mine area were established on the strategic points or the boundaries of the mining site.

The mine tailings dam area (Plate 10B), including the areas that would be flooded during the disposal of mine tailings were inspected. Most of it is presently residual forests. Ferns and trees dominate the flora of the area.

The western and eastern sections covered by the Mineral Production Sharing Agreement (MPSA) area are composed of rough and steep topographic features wherein no possible archaeological materials can be found (refer to Figure 3).

However, there were no archaeological materials recovered or observed during the conduct of surface survey.

8.3.3 Results of test excavations

A total of four (4) test pits with an average dimension of 50 cm x 50 cm were opened for possible recovery of cultural materials. The locations of these test pits were randomly selected wherein the possibility of finding material evidences was thought to be high and in most cases, the area could also serve as good catchments for cultural artifacts transported from higher elevations in the surrounding landscape. Observations were recorded and measurements made at every layer of the contents of the matrix. Generally, the excavation was approximately confined to thirty centimeters depth for the purpose of determining the possible presence of cultural materials. This was sufficient after observations of the road cuts showed deep profile of the land, where bedrock types were very much near the surface. Below are the descriptions of the deposition of layers.

The sediment layers were carefully noted and plotted. The sediment types and color of each layer were identified. Color was taken using the Munsell Color Charts (1992 Revised Edition) (refer to Figure nos. 4 to 7).

Test Pit 1 (Sta. #3)

07° 44.30 N; 122° 16.43 E

Layer 1	-	Color:	7.5 YR 5/6; strong brown
		Texture:	Sandy silt loam
		Consistence:	Gritty, loose, firm
		Stickiness:	non- plastic; sticky

Test Pit 2 (Sta. # 5)

07° 43.35 N; 122° 16.34E

An exposed outcrop revealed the presence of ash deposit probably caused by weathering of volcanic ash approximately 10 cm thick. This road cut has an average depth of 100 cm. There were two soil layers observed:

Layer 1 -	Color:	10 YR 3/3; dark brown
	Texture:	Sandy silt loam
	Consistence:	Gritty, loose, firm
	Stickiness:	non-plastic; sticky
Layer 2-	Color:	7.5 YR 4/6; strong brown
	Texture:	Sandy silt loam
	Consistence:	Gritty, loose, firm
	Stickiness:	non-plastic; non-sticky

Test Pit 3 (Sta. # 14)

07° 43.55N; 122° 16.30E

The test excavation had revealed three (3) soil layers with an average depth of 35 cm. There were no cultural materials found in this pit.

Layer 1 -	Color:	10 YR 4/4: dark yellowish brown
	Texture:	Sandy silt loam
	Consistence:	Loose
	Stickiness:	non-plastic; non-sticky
Layer 2-	Color:	10 YR 4/4; dark yellowish brown
	Texture:	Sandy silt loam
	Consistence:	Loose
	Stickiness:	non-plastic; non-sticky
Layer 3-	Color:	2.5 YR 4/8; red
	Texture:	Sandy silt loam
	Consistence:	Loose
	Stickiness:	non-plastic; non-sticky

Test Pit 4 (Sta. # 17)
07° 44.29N; 122° 16.37E

There were two soil layers observed with an average depth of 30 cm. There were no cultural materials observed during the test excavation.

Layer 1-	Color:	10 YR 4/3; brown
	Texture:	Sandy silt loam
	Consistence:	Loose
	Stickiness:	non-plastic; non-sticky
Layer 2-	Color:	2.5 YR 4/6; red
	Texture:	Sandy silt loam
	Consistence:	Loose
	Stickiness:	non-plastic; non-sticky

9.0 IMPACT ASSESSMENT

The areas that will be affected by mining operations, plant site, and mine tailings dam projects of the TVI Resource Development Philippines, Inc. in Sitio Canatuan, Barangay Tagbayo, Municipality of Siocon, Zamboanga del Norte yielded no archaeological materials. This assessment is based on the negative results of the three components of the archaeological survey: informant interviews; surface survey done on road cuts, trails, banks of creeks and archaeological test pit excavations in the area concerned. The field interviews conducted among the residents of Sitio Canatuan, Barangay Tagbayo did not yield any significant and verifiable archaeological information concerning the survey area. Although, there were accounts citing the presence of tradeware ceramics but the area referred to is far off from the applied boundaries of the TVI mining site.

The absence of any material evidence of prehistoric human activities in the survey areas can be attributed to the location. The site is relatively high and far from the preferred prehistoric habitation sites of near rivers or seashores. The area was believed to be heavily forested and show traces of logging activities. However, the known indigenous community inhabiting the locality is the Subanon. This group commonly settled in a highly dispersed with a few residential structures on top of ridges near potable water sources (Peralta 2000). Their preferred locations are near springs rather than streams. If ever there were ancient humans in the area, they were most likely hunters and gatherers. Hunters and gatherers are nomadic people and the most probable place to find their material remains are in dry caves and rockshelters. They usually utilized caves and rockshelters as camps during hunting. However, caves or potential rockshelters are not visible in the area.

10.0 MITIGATION AND MANAGEMENT MEASURES

Based on the archaeological survey and exploration conducted, the areas that will be affected by the mining operations of the TVI Resource Development Philippines, Inc. Siocon Gold-Silver Mining Project in Sitio Canatuan, Barangay Tagbayo, Siocon, Zamboanga del Norte were found negative of any archaeological and cultural materials.

It is recommended however, that if during the implementation of the earth-moving activities, any chance discovery of archaeological remains are noted, the matter should be reported immediately to the Director of the National Museum as contained in the mandatory procedures under **Republic Act 4846**, as amended by **Presidential Decree 374**, otherwise known as “**Cultural Properties Protection and Preservation Act.**”

During the implementation stage of the project, surveillance and monitoring should be maintained in the possibility of any chance discovery of archaeological materials. A competent archaeologist may be assigned to monitor the project area. Another monitoring option is to conduct a short training for the TVI Resource Development Philippines, Inc. Mining Project personnel assigned to the project area in the identification of chance archaeological finds.

Provisions for salvage retrieval/recovery of chance archaeological and historical finds during the project implementation must be considered. Such provisions will minimize unnecessary delays during project implementation and will help ensure the preservation of what could be irreplaceable cultural heritage of the country.

11.0 REFERENCES:

- Alegre, Leonardo A.
 1975 Salvage Archaeology (Dapitan City, Zamboanga del Norte). *Typescript*. National Museum, Manila, Philippines.
- Archaeological, Cultural and Environmental Consultancy Inc. (ACECI)
 2003 Archaeological Impact Assessment: Didipio Gold-Copper Project. *Manuscript*. Archaeology Records Section, National Museum. Manila.
- 2003 Archaeological Impact Assessment: Calabarzon Natural Gas Transmission Pipeline Project. *Manuscript*. Archaeology Records Section, National Museum. Manila.
- 2002 Archaeological Impact Assessment: Nonoc Island Mining Area-5 Sigbanog Project Surigao City, Surigao del Norte. *Manuscript*. Archaeology Records Section, National Museum. Manila.
- Bautista, Angel P. and Antonio P. Peñalosa
 1994 Archaeological Assessment of Spanish Historical Sites at Tukuran, Zamboanga del Sur. *Unpublished Field Report*. National Museum, Manila, Philippines.
- Bersales, Jose Eleazar R.
 1994 The USC Archaeological Field School in Tukuran, Zamboanga del Sur: Some Personal Notes. *Philippine Quarterly of Culture and Society* 22: 306-310. Cebu City: University of San Carlos.
- Beyer, H. Otley
 1947 Outline Review of Philippine Archaeology by Islands and Provinces. In *The Philippine Journal of Science* 77 (3-4): 318-324.
- Ronquillo, Wilfredo P., Maharlika A. Cuevas and Sheldon Clyde B. Jago-on
 1997 Sibutad Archaeological Survey. *Typescript*. National Museum, Manila, Philippines.
- Peralta, Jesus T.
 1977 Summary Report on the Megalithic Structures of Zamboanga del Sur. *Typescript*. National Museum, Manila, Philippines.
- 2000 *Glimpses: Peoples of the Philippines*. National Commission for Culture and the Arts. Manila.
- Señires, Yolando Z. and Roberto de Ocampo
 1976 Preliminary Report on the Geologic Reconnaissance of the Said Megaliths in Zamboanga del Sur. *Typescript*. National Museum, Manila, Philippines.
- Ronquillo, W.P. and E.Z. Dizon
 1999 An Archaeological Resource Management Manual for the National Museum of the Philippines. *National Museum Papers*, Vol. 9 (2): 28-37.
- Ronquillo, W.P.
 1993 Anthropological and Cultural Values of Caves. *Philippine Quarterly of Culture and Society*, Vol. 23:138-150.

12.0 LIST OF MEMBERS OF THE ASSESSING TEAM

Sheldon Clyde B. Jago-on, ACECI Board member, is an experienced archaeologist, conducting archaeological excavations and explorations since the mid-1990s in both terrestrial and underwater. He obtained his Diploma in Archaeology from the Archaeological Studies Program at the University of the Philippines. He is presently the Secretary of the Katipunan Arkeologist ng Pilipinas (KAPI) – a professional guild of Philippine archaeologists.

Josefina G. Belmonte, Ph.D. Candidate, ACECI Board member, is a faculty of the University of the Philippines Archaeological Studies Program. She is an experienced archaeologist, conducting archaeological excavations and exploration. Ms. Belmonte is finishing her Doctoral degree in Archaeology at the University College of Londo, UK. She is also actively involved in museological projects. She is presently the Vice President of the Katipunan Arkeologist ng Pilipinas (KAPI), a professional guild of Philippine archaeologists.

Nida T. Cuevas, M.A. Candidate, has been involved in archaeological work since 1985. Ms. Cuevas received her Diploma in Archaeology at the University of the Philippines Archaeological Studies Program. She is currently finishing her Master's degree in the same program and University. She is also an active member of the professional guild – the Katipunan Arkeologist ng Pilipinas (KAPI).

Jane Carlos, is a trained graduate student from the Archaeology Studies Program at the University of the Philippines, Diliman, Quezon City. She finished her Bachelor's degree in Agriculture at the University of the Philippines, Los Baños, Laguna. She is an active member of the Katipunan Arkeologist ng Pilipinas (KAPI).



Figure 1. Map of Mindanao Island showing Zamboanga Peninsula and Siocon Municipality



Figure 2. Location map of the proposed mining activity of TVI Resource Development, Inc. Canatuan Project covered by MPSA.

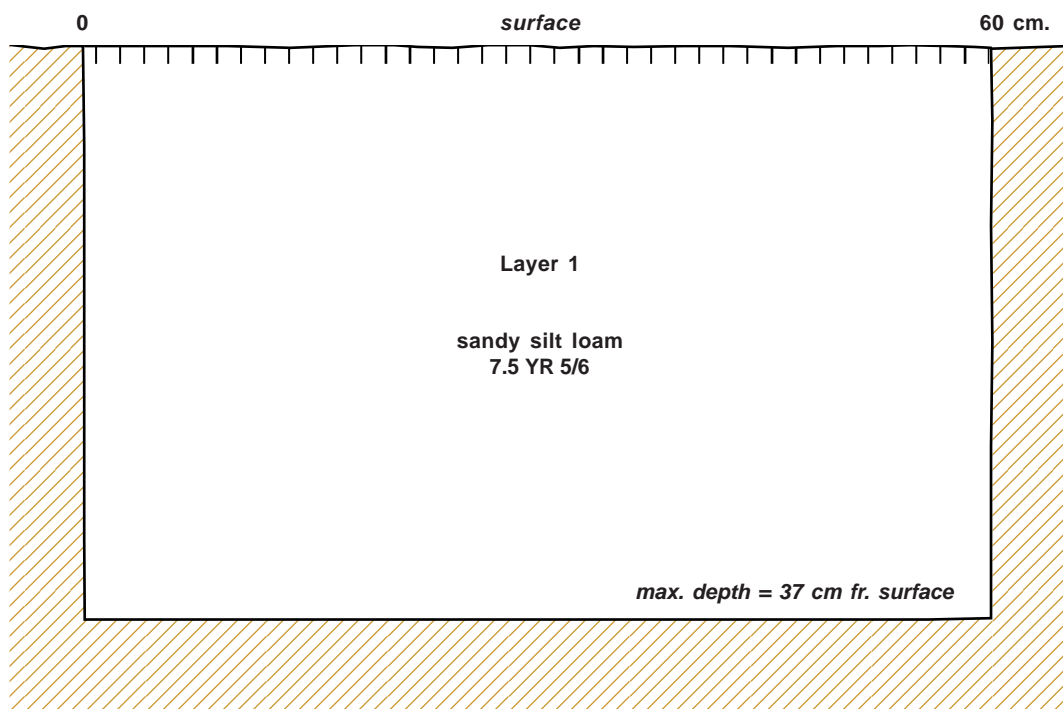


Figure 4. Test Pit 1 sediment profile

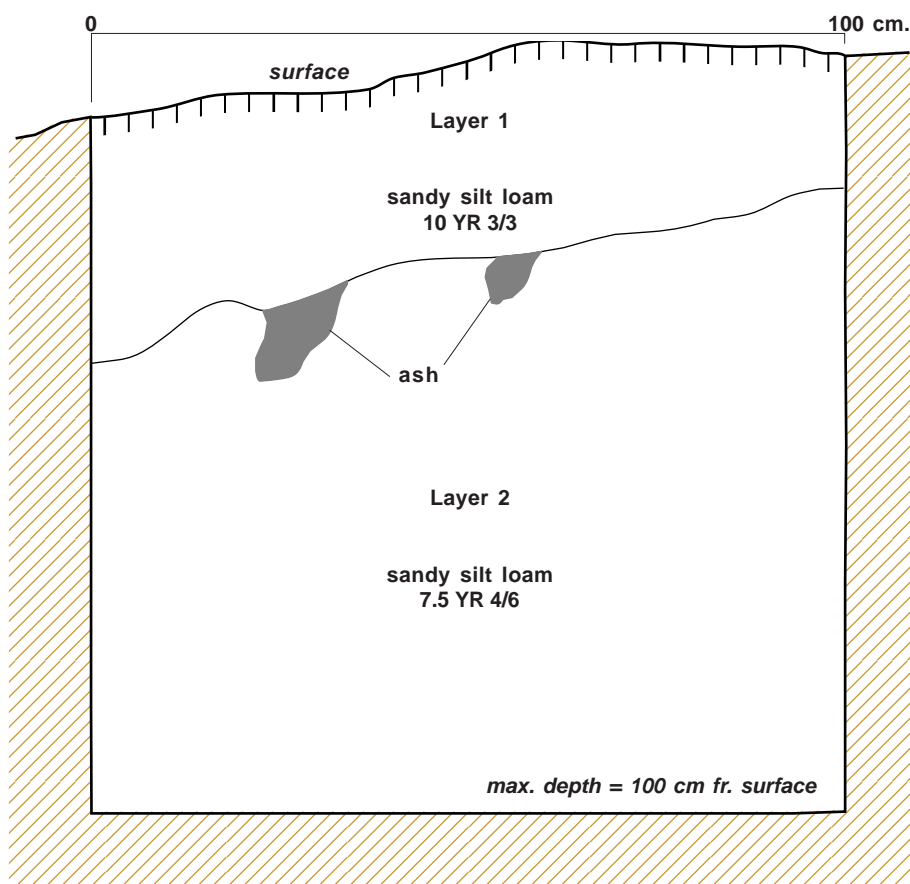


Figure 5. Test Pit 2 sediment profile

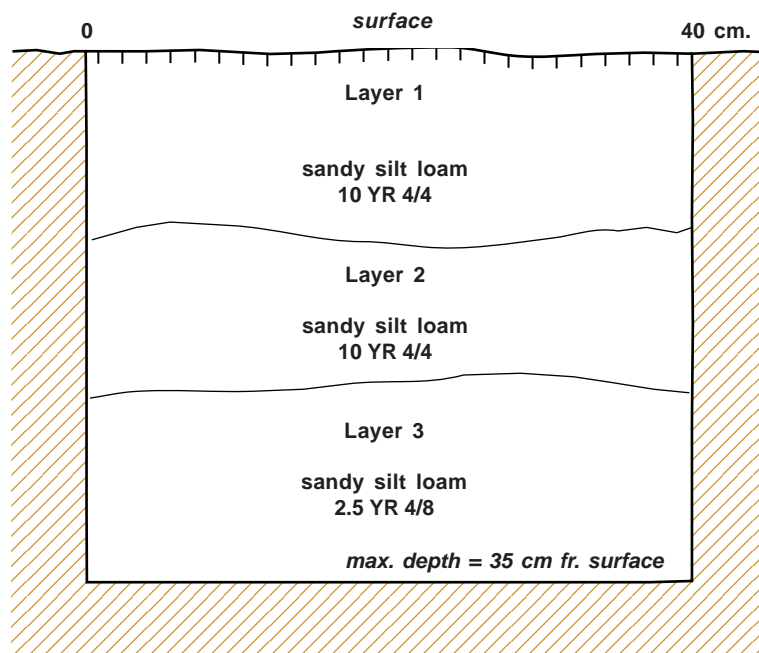


Figure 6. Test Pit 3 sediment profile

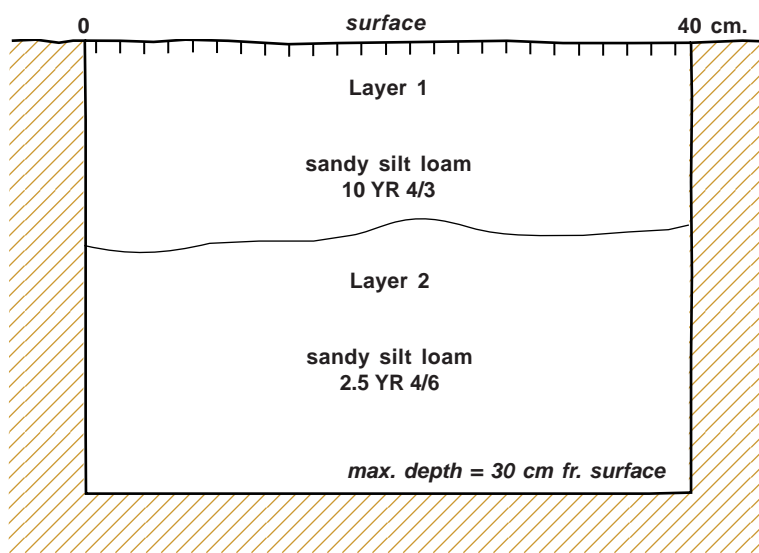


Figure 7. Test Pit 4 sediment profile



A. Panoramic view of the TVI Resource Development Philippines, Inc. mining site taken from the point of the starters pit



B. TVI Resource Development Philippines, Inc. old growing plant
Plate 1



A. The photograph show the vegetation along the Canatuan River



B. Residential establishments for TVI employees.

Plate 2

A. The team leader of the archaeology group coordinating with the TVI Environmental Safety Officer



B. The importance of laptop and notebook computers in report writing when on field.

Plate 3



Personnel from the TVI Resource Development, Inc. accompanied the archaeological survey group to determine boundaries covered by MPSA.

Plate 4



The method of field-walking in search of archaeological materials is conducted in cleared areas, trail, road cuts and in banks of rivers and creeks. A GPS reading was taken in every area that was surveyed.

Plate 5



The conduct of interview among the local people in the area was done by showing the archaeological kit.

Plate 6



A. Test Pit 1. This is an archaeological test excavation conducted along the canatuan creek to probe the possible presence of archaeological materials.



B. Test Pit 2. An exposed outcrop along the road was investigated for possible existence of artifacts and its sedimentation.

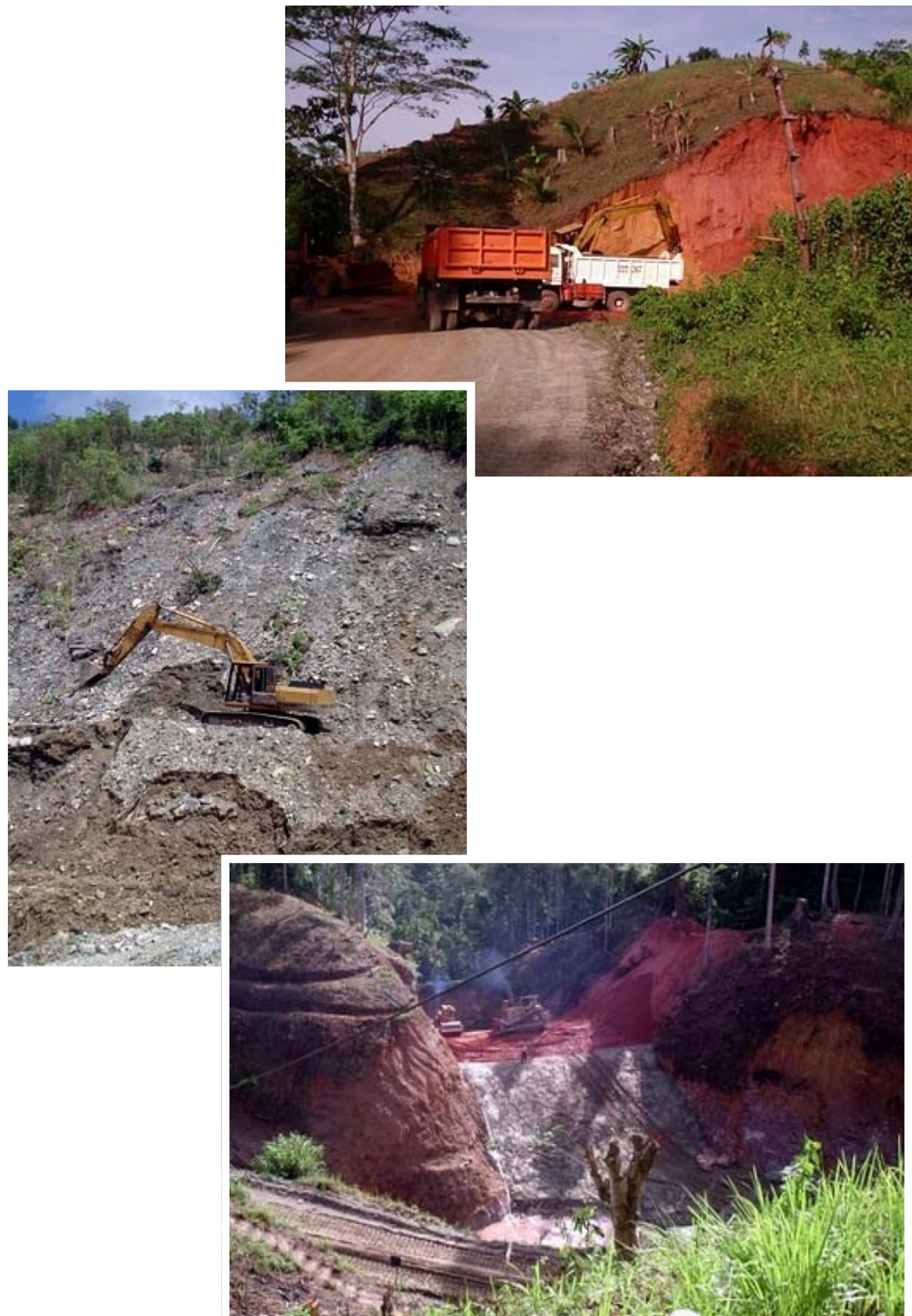




A. Test Pit 3. The excavation was conducted south of the stater pit



B. Test Pit 4. The test excavation of test pit 4 was located on a forested area approximately 15 meters away from Malusok Road



The mining activity of TVI Resource Development Inc.

Plate 9

A. The milling area.



B. The tailing dam area.



Plate 10

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- A. Test Pit 3. The excavation was conducted south of the stater pit
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Plate 10.

- A. The milling area.
- B. The tailing dam area.

ARCHAEOLOGICAL IMPACT ASSESSMENT

TVI RESOURCE DEVELOPMENT PHILIPPINES, INC. (Canatuan Project)



**Archaeological, Cultural and Environmental Consultancy, Inc.
(ACECI)
Manila, Philippines**

October 2004

ARCHAEOLOGICAL IMPACT ASSESSMENT

TVI Resource Development, Inc. Canatuan Project

