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NATURAL RESOURCES MANAGEMENT PROJECT

BAPPENAS – Ministry of Forestry
Assisted by
USAID

PROCUREMENT PLAN FOR RESEARCH EQUIPMENT AT BUKIT BAKA AND EQUIPMENT INSTALLATION AT SAMARINDA FORESTRY RESEARCH STATION

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for
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USAID – Jakarta

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REPORT NO. 1

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PREFACE

The development of a research facility at the Bukit Baka/Bukit Raya location on the border of Central and West Kalimantan emphasises the high interest that the Government of Indonesia, the United States Government, and the international forestry community takes in the development of Indonesia's tropical rain forest resources. It follows an earlier Forestry Research Center development project in Samarinda in East Kalimantan and at present is viewed as an extension of that center.

This consultancy had two major components. The first was the facility at Bukit Baka/Raya. Recommendations for the development of the infrastructure of the Bukit Baka/Raya facility and specific equipment and materials needed were determined. Secondly, newly aquired equipment and supplies at the Forestry Research Center in Samarinda were in need of installation and calibration. Staff at Samarinda also needed assistance in equipment operation and use. In the limited time available the equipment was installed and staff was given preliminary training. Because of lack of supplies and chemicals actual hands-on anylytical training was not possible at this time. Supplies and chemicals needed were also determined and listed for priority ordering.

This report is an attempt to guide project personnel on the necessary actions needed to develop the facility at Bukit Baka and to report on the progress at the Forestry Research Center at Samarinda.

It is written in two parts indicated by Bukit Baka/Raya (pages 1 through 26) and Samarinda (pages 27 through 47).

At Bukit Baka an estimated 236 thousand dollars may be necessary for the construction of the infrastructure (site and buildings). An additional 50 to 75 thousand dollars for equipment and 16 thousand dollars for supplies and chemicals to stock the labs would also be needed (US catalog prices).

In Samarinda, chemicals and supplies for the labs are needed immediately to make the equipment supplied useable. A minimum of 16-17 thousand dollars (US catalog prices) are needed. Additional equipment is also needed and a future survey of research needs should be done to determine priorities.

Individual executive summaries for Bukit Baka and Samarinda are found on pages 1 and 27 of the body of the report.

C

Bukit Baka

20 December 1991
[bbwork1.doc]

Equipment and Infrastructure Development at Forest Research Institute, Buka Baka/Raya Branch Station (FRIBB/R)

Roy Voss, ARD/NRMP/USAID/GOI

Jakarta, Indonesia

EXECUTIVE SUMMARY:

The expedient construction of the Bukit Baka/Raya Station and procurement of equipment and supplies necessary for it to become completely operational is necessary if the project is to meet its objectives in the time frame allowed by the project.

A survey trip to the project area (December 12 to 17, 1991) and review of previous reports has been completed.

Recommendations include development of adequate travel and communication facilities and placement of those facilities in the project area. Radio capabilities and well established and published protocol on both emergency and day to day communications is recommended to prevent waste of time and money through miscommunication. This should also include approval criteria for visiting scientists.

Construction of 800 m² of headquarters, lab and office space and 42 units of housing are recommended with careful attention to site preparation to prevent unnecessary cutting of trees and soil disruption. A site survey (topographic) must be done to allow for the correct placement of all buildings and assurance that waste waters will not contaminate surface water supplies. Buildings should follow local style and GOI guidelines in construction. Provision must also be made for perpetual road maintenance.

Water and power needs may possibly be met with hydraulic installations (ramjet pump for water and dynamo for electricity), but electrical power will need standby diesel generator(s). Cost of pumping water versus the cost of piping from higher up the river will need the topographic survey results before a decision is finalized. Assumptions of differences of water quality further up river need verifying. Long range economics must also be examined as final decisions are made.

Equipment and supplies necessary for basic forestry and ecological research has been identified and listed. An attempt has been made to put them in priority ranking because of budget constraints but it must be realized that much of the usage of equipment and supplies is so interrelated that providing equipment without supplies to use with it is counterproductive.

While many people were consulted, any errors or omissions rest solely with the author of this report.

INTRODUCTION:

Since the inception and approval of the forestry research and training field station at the Bukit Baka nature reserve, numerous people have had an opportunity to file comments and recommendations on its objectives and function, as well as record suggestions on its design and operation. This report is an attempt to integrate these many ideas into a working document that will allow for the expedient construction of the station and procurement of equipment and supplies necessary for it to become completely operational.

THE BUKIT BAKA/RAYA STATION:

Logistics:

Located near the border between Central and West Kalimantan, the FRIBB/R site is situated at approximately Km 55, of the main logging road of the Sari Bumi Kusuma (SBK) Forest Concession, 20 km from the company's base camp (km 35) and 55 km from the SBK log pond on the Melawi River, a tributary of the Kapuas. NRM personnel are temporarily being housed at the SBK camp at Km 54. The log pond is a 1.5 hour river trip by speedboat from the nearest town and airport at Nanga Pinoh, Kalimantan Barat (West Kalimantan). Nanga Pinoh airport is serviced by thrice weekly (M,W,F) flights from Pontianak by the Government Carrier, Dirgantra Air Services (DAS). Because DAS flights are sometimes canceled, arrangements for chartered flights by the Mission Air Fellowship (MAF), also located in Pontianak, are sometimes necessary. Large shipments are supplied through Nanga Pinoh by river boat from Pontianak. Other than a small company store at Km 35, all food and supplies must be procured in Nanga Pinoh, which has facilities for receiving and filling orders by radio from SBK camps and presumably would also be able to service the project personnel.

Transportation and communication:

A total of 3 or 4 motor vehicles and a speedboat are planned by the project. The vehicles will be located at the FRIBB/R site and the speedboat at either the log pond or at Nanga Pinoh. (The log pond might be preferred for emergency reasons though, as a boat can nearly always be chartered at Nanga Pinoh, but not necessarily at the log pond.)

Radio communication facilities for FRIBB/R will be needed as soon as possible. Company cooperation has been good, but security and building of perceived obligations preclude long term dependence on the cooperation of the logging companies for critical services. Written guidelines for both routine and emergency communications and transport are essential to prevent loss of time, money and assure personnel safety. Approval of visitors and providing for their safety and conduct will also warrant written guidelines.

In the future, with proper equipment, communication "patches" may be made possible with telephone lines in Nanga Pinoh for direct outside communications. Conceivably, direct communications without land lines will be available as satellite technology advances!

Site Development:

The site at km 54 is located between .5 and 1.5 km off the main logging road. While this enhances the comfort of the station (absence of dust and road noise) it does call for a road maintenance budget that will be needed forever or until the Trans-Kalimantan Highway reaches the area (so that government road maintenance can be obtained)! Consideration must also be given to assuring that the Km 34 to km 54 road is kept open!

A topographic survey of the site is needed IMMEDIATELY. When completed, final arrangement and placement of the various buildings may be accomplished.

Rather than a crowding of facilities in a small area, it is being proposed that the main office facilities and labs be located on the first clearing and the residential buildings be placed along the branching roads heading up toward Bukit Baka (Fig. 1). It is strongly urged that the building contractor be warned AGAINST THE UNNECESSARY CUTTING OF TREES while preparing the building sites!

Construction will follow according to GOI guidelines for public buildings and accommodations. Where recommendations herein are to the contrary, GOI guidelines will prevail, but it is hoped that all professional staff will be housed in similar single family cottages! It is imperative that construction be of a permanent nature and be designed in accordance with local public building style. Ulin shingles (syrap) are the preferred roofing material for all office and residential buildings. Corrugated zinc should be used only on the garage and generator shed.

Provision for an emergency helicopter landing pad should be made between the main building and the main logging road. This can be a grass pad with markings visible from the air and maintained as short grass with adequate clearance on all sides for helicopter landings. A wind sock visible from the air should also be maintained at the pad. In the longer time frame, consideration for a 300 meter portion of relatively smooth roadway cleared on both sides for single engine plane landings and takeoffs may be desirable and may be negotiated with the concessionaires.

Concepts are presented in the attached sketches showing layout of headquarters and housing buildings.

Buildings Needs / Staffing:

Because of the level of staffing anticipated by the station it is going to be necessary to conduct a major building program for the work site as well as for housing personnel.

Anticipated Staffing Includes:

Professional

Deputy Director BPK (Director Sub-Balai)	1	
Administrative Officer	1	
Senior Advisory Staff:	4	
Counterpart Staff:	4	
Junior Professional Staff:	12	
Visiting Staff (Students/Scientists)	10	(maximum!!!)

Support Staff

Secretarial	3
Drivers (Boat operator stays at logpond)	3
Field Staff	8
Security	2
Maintenance (mechanical/grounds)	2
TOTAL	50

While it is not anticipated that this level of staffing will be reached immediately, provision for facilities must be made now in light of time for construction and being able to become fully operational in the shortest possible time. Consideration should also be given to setting up strict guidelines for approval of visiting scientists. Accommodations, manpower and housing are limited and over-extension of the facility to accommodate non-essential research will be counter-productive during the first couple of years of operation. Reasonable accommodation costs must be born by visiting scientists working at the station.

Buildings:

	(m)	(m2)	(m2)	Estimate Rs (000000)
1. Entrance/Director/Library	10x20	200	200	24
2. Offices/Dry Lab.(Botany/Herb)	10x30	300	300	36
3. Offices/Computer/Wet Lab.(Soil, Water, Conservation, Agro-forestry, etc.)/Dining Hall	10x30	300	300	36
4. Kitchen/Coop. Store/Storage	10x12	120	120	10
5. Garage/Shop	10x12	120	120	6
6. Generator Shed (Genset Installed)	3x3	9	9	1
7. Single House (10 Units Total)	10x10	100	1000	120
8. Attached Housing (12 families) (3 buildings x 4 families)	10x8	80	960	78
9. Visitors Quarters (10 units) (2 buildings x 5 units)	5x6	30	300	108
10. Workers Quarters (1 building 10 units)	10x5	50	500	41
TOTAL (Housing for 42 staff)			3809	460

Cooperative Store:

A small provisions store is suggested following the custom of government employee groups forming cooperatives. Its location near the headquarters buildings is to consolidate food storage in one place, but alternate placement of the store nearer the housing areas may be considered.

Nursery and Athletic Field:

At the present time it is not felt that a nursery at the BB/R headquarters site is justified. The BKL nursery is close by and could serve the minimal needs for the headquarters location. Reforestation and agroforestry nursery needs must be met in the locations where seedlings are going to be needed and should be done at minimal cost.

Athletics and recreation are available at/with the BKL camp and the BPKBB/R housing is located near an attractive stream that should encourage recreation. It is not recommended that funding be used to develop any recreation field at this time.

Water system:

A water system using relatively pristine stream water from an undisturbed forest is available in the river below the site. Pending completion of a topographic survey of the area it is uncertain whether a catchment box higher up the stream from the camp (above the camp level so water is gravity fed) and piped down would be more cost effective than a hydraulic ram pumping system closer and below the level of the site. Ram pumps are very simple pumps operating off hydraulic flow to divert a portion of the water to a higher elevation. Piping distances and cost would have to be compared to the savings on pipe with the hydraulic ram pump. Water for Km 54 could be supplied from any place on the river with sufficient elevation to provide a pressure head. Cost of 2" PVC water lines at Nanga Pinoh are approximately US$ 1 per meter. A collection box with debris filter is all that would be necessary. (NOTE: The assumption that the further up stream you go the better the water quality will be may not hold true due to the large numbers of wild animals, especially wild pigs, that have access to the stream at higher elevations. Any stream water should not be used as untreated drinking water in any case.)

A 2000 to 8000 gal. elevated storage tank (1x1x2 m to 2x2x2 m) would also be necessary regardless of the system used.

Electrical system:

Alternatives also exist for electricity generation. The water flow in the stream adjacent to the site has led to the suggestion of using a hydraulic dynamo (generator) for power. This would require construction of a concrete dam and installation of a dynamo appropriate to station needs as limited by stream flow.
The ecological significance of the system is obvious and is worthy of analysis by someone familiar with small hydrological power systems. This can be checked out and reported on upon the author's return to the US.

Backup power and/or the main source of power can be readily supplied by diesel generators. Costs for small diesel generators (up to 10 KW systems) may cost approximately US$1000/KW for the genset and consume between 3 and 10 liters of fuel per hour. The question of providing two generators (one on standby status) or a hydraulic system with diesel standby will depend on a realistic economic analysis of initial cost, operating costs and ecological significance.

Computer and small equipment should be provided with battery back-up facilities immediately. A 12 V. vehicle battery can supply up to 4 hours of desk top computer or vcr operations when fully charged. Battery chargers and batteries are locally available and an invertor (12 V DC input - 120 or 220 V AC output are available from Sears Roebuck and Company).

Waste/sewers:

Waste water and septic systems must be well designed to protect the streams from contamination and provide a good example for employees and visitors alike. Septic tanks to direct waste flow through the soil must be dug for all WC facilities. Wash water and kitchen waste water (so called "grey water") may also follow the WC drain if infiltration rates can tolerate the additional load. Otherwise, shallow, gravel filled drain fields may have to be constructed to accommodate waste water. Asian style bath and WC facilities are assumed. Westerners unaccustomed to this may consider supplying their own "porta-potty" addition to the WC.

Supplies and Equipment:

Basic equipment, chemicals and lab supplies have been identified for procurement assuming research priorities provided by numerous people. Specialized equipment for visiting scientists may have to be supplied by the scientists themselves.

It has been assumed that plant studies and environmental quality studies would be the primary users of the laboratories. A "dry lab" (one not doing chemical analysis) for botanical, herbarium and related studies has been proposed for the station. A similar sized "wet lab" where chemicals are used and extracts of plants and soils and water are prepared for submission to other locations for analysis (and other messy types of lab work) has also been designated. Much of the equipment, chemicals and supplies are to be used for these labs.

Administration needs, audio visual equipment, drafting equipment and similar materials have been suggested because of the remoteness from commercial services such as photocopying, blueprint and map printing. Meteorological data analysis plays an important part in all environmental studies and requires relatively sophisticated equipment to collect the data.

An item by item justification has not been done but priority items (those urgently or critically needed) have been indicated and should receive first consideration given budget constraints.

An attempt has also been made to standardize equipment and supplies between BB/R and Samarinda so that researchers are can more easily work in either location and that results are more uniform and comparable.

CONCLUSIONS:

Under time and budget constraints it is difficult to develop a program from inception even at convenient locations. The additional difficulties posed by the remote location of Bukit Baka/Raya do not need elaboration here, but they are immense!

This report hopefully will serve as a working document to assist in the finalizing of architectural and infrastructure plans for the station so that contracts can be formulated and awarded for the actual construction. Cost estimates are approximate and unfortunately probably conservatively low. Because of this, priorities must be established so that the essential things get done and are not lost to spending on non-essentials.

No frivolous items have been included in the buildings, equipment and supplies and many specialized items have had to be omitted from consideration. Ideally, visiting scientists will have their own research budgets so that these omissions may be supplied.
If this is done, eventually the research facilities will have an opportunity to grow from barely adequate to sufficient.

ANNEX:

Itinerary:

12 December 1991 Depart Jkt. - Pontianak (Overnight Pontianak)
13 December 1991 Depart Pont. - Nanga Pinoh - FRIBB/R (Overnite SBK Km 54)
14 December 1991 FRIBB/R (Overnite SBK Km 54)
15 December 1991 FRIBB/R (4:00PM Travel to Km 35 - overnite at SBK base camp)
16 December 1991 Depart Km 35 - Nanga Pinoh - Pontianak (Overnite Pontianak)
17 December 1991 Depart Pontianak - Jkt.

People Consulted:

Fernando Potess --- ARD/NRMP/FRIBB/R

Mering Ngo --- ARD/NRMP/FRIBB/R

Ny. Lisa Corrin --- ARD/NRMP/FRIBB/R

Marla Potess --- Pontianak

Pak Adju --- Nanga Pinoh (SBK Nanga Pinoh agent)

Pak Augustus --- SBK Km 35 Base Camp

Pak Asbani Wiryokusumo --- SBK Management - Km 35

Sukarman --- ARD/NRMP/FRIBB/R Pontianak office

Monika Kusneti --- ARD/NRMP/FRIBB/R

Pak Sakaraiah --- Meteorology Station, Pontianak Airport

Drawings and Figures:

Attached

Equipment List:

Attached

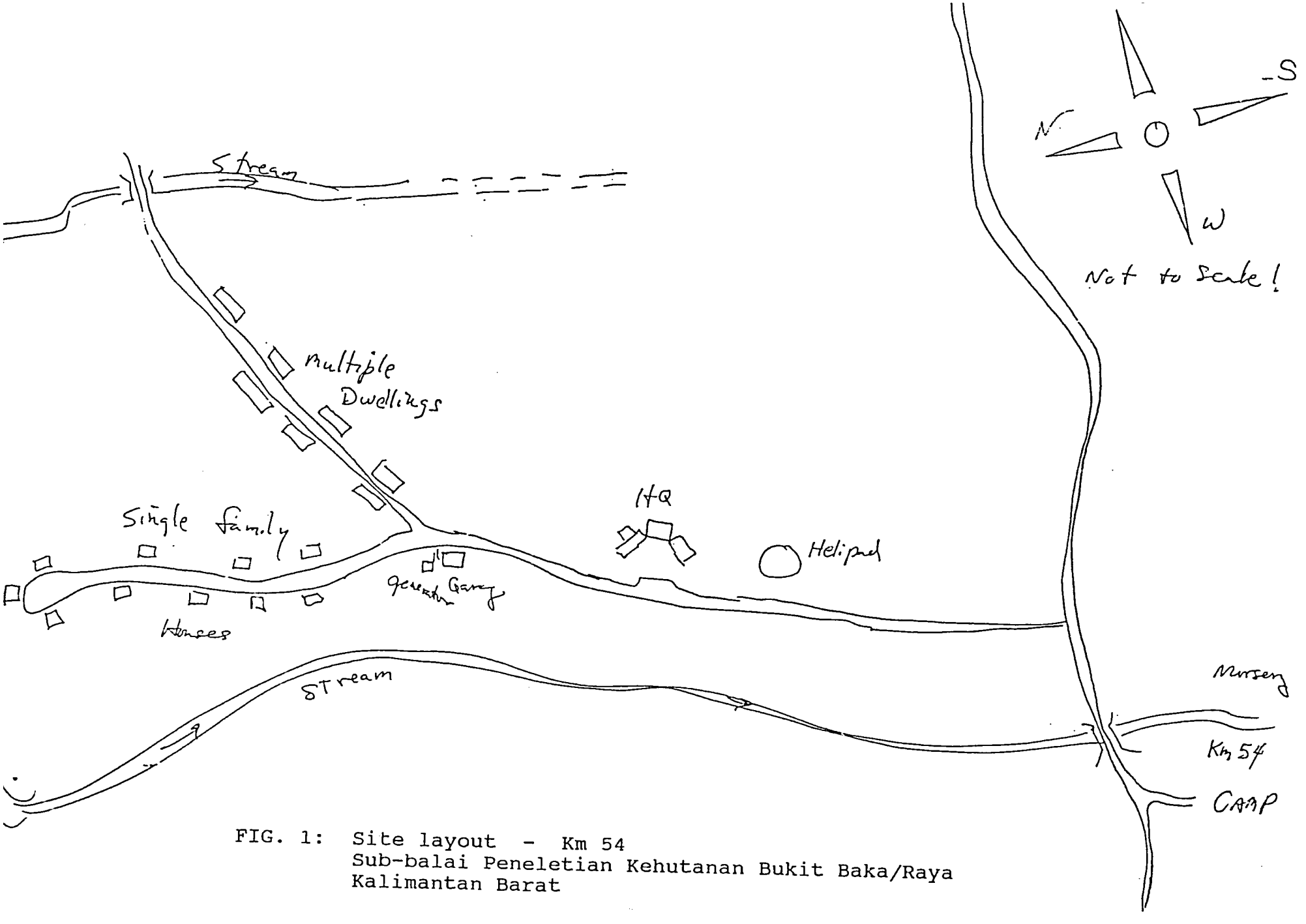
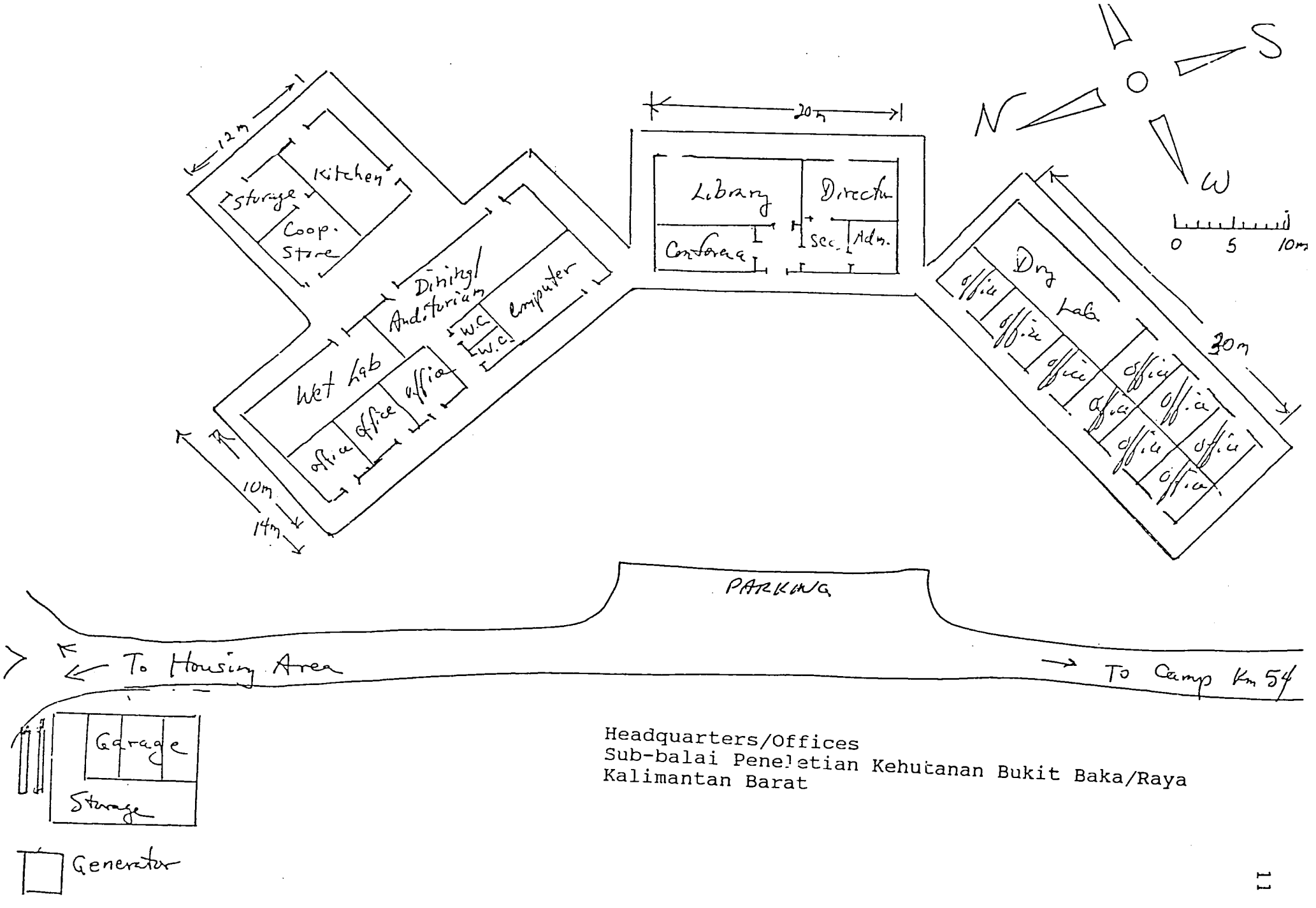
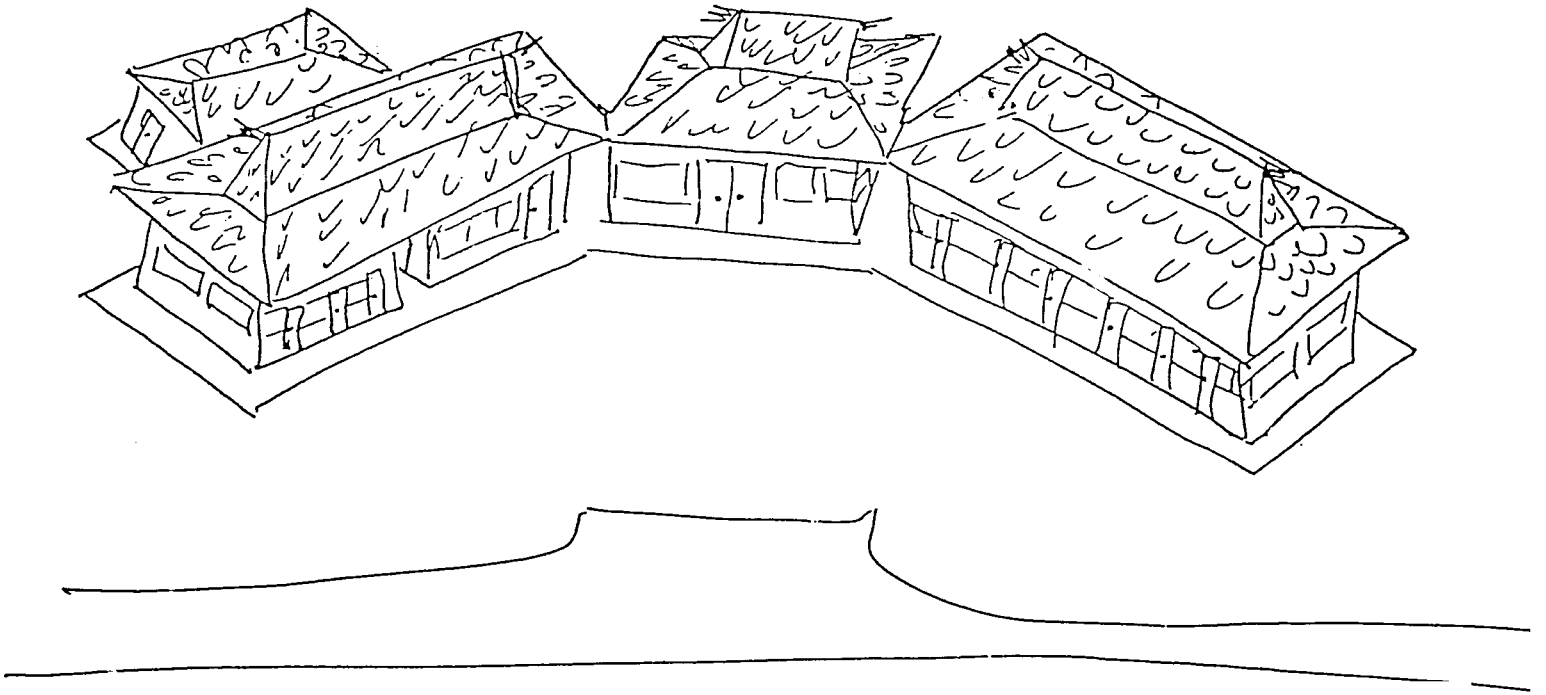


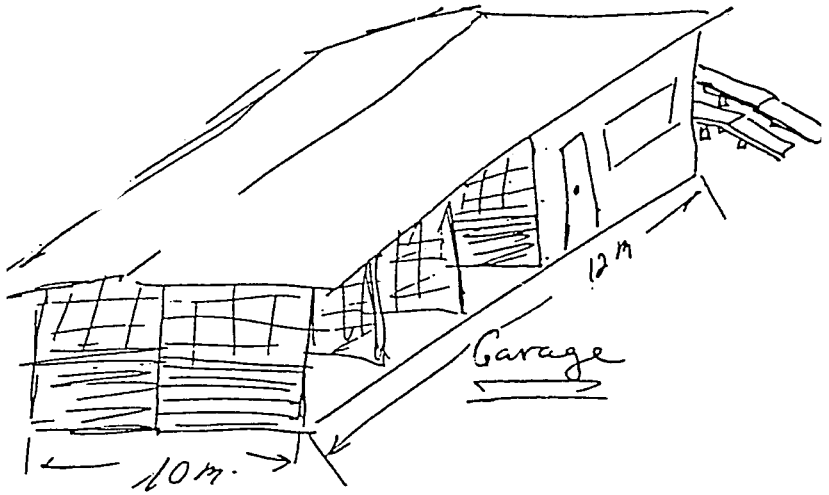
FIG. 1: Site layout - Km 54
Sub-balai Peneletian Kehutanan Bukit Baka/Raya
Kalimantan Barat

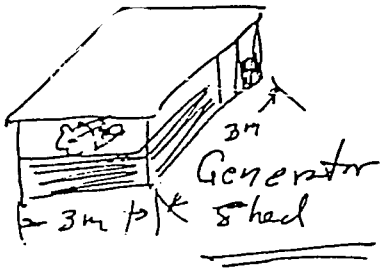


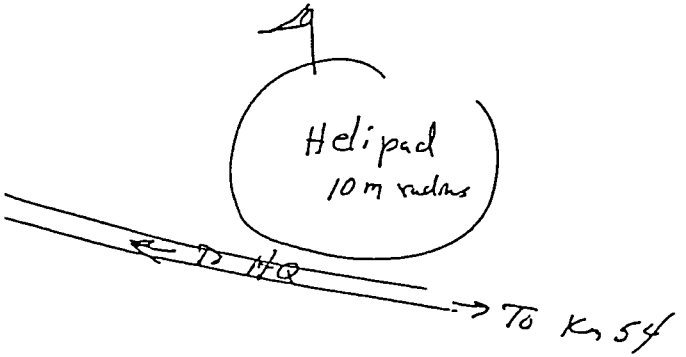
Headquarters/Offices
Sub-balai Peneletian Kehutanan Bukit Baka/Raya
Kalimantan Barat



Headquarters/Offices
Sub-balai Peneletian Kehutanan Bukit Baka/Raya
Kalimantan Barat







Not to Scale!

Garage, Generator Shed and Heli-pad
Sub-balai Peneletian Kehutanan Bukit Baka/Raya
Kalimantan Barat

EQUIPMENT FOR BUKIT BAKA [BBORD91.WK3]

Equipment Order No. 1

Priority	NO.	ITEM NAME, specifications	QTY. PACK	CAT.#	VENDOR	UNIT PRICE	TOTAL PRICE US$
1	1	TOP-LOADING BALANCE Electronic type, dual range to 60 and 360 gm eqv. to Mettler Model PE360 Delta Range (F.# 01-913-389) for 220 VAC.	1 each	1913389	Fisher	1550.00	1550.00
1	4	MICROSCOPE, Stereo zoom Magnification up to 4x with optical unit plus 10x and 20x wide-field eye-pieces. Illuminator and stand. Eqv. and (F.# BL 31-33-05-28).	1 each		Fisher	1465.00	1465.00
1	5	OVEN, Mechanical convection Variable temp ovens with 3.75 cu.ft. capacity. For 220 VAC. Eqv. to Isotemp Model 338F. (F.# 13-245-339F).	1 each		Fisher	1661.00	1661.00
1	6	REFRIGERATOR/FREEZER For freezing and cold storage, 11 cu.ft. 2-5 deg.C. and 2.5 cu.ft.-12 to -17 deg. C. volume. For 220 VAC, eqv. to (F.# 13-988-105).	1 each		Fisher	1370.00	1370.00
1	13	pH METER, portable Batery operated with spare electrodes and accessories (Fisher # 13-637-640)	1 each		Fisher	430.00	430.00
1	14	DEIONIZER Lab unit to produce 19-36 l/hr high capacity iron free water.(F.# 09-033-10)	1 each		Fisher	1320.00	1320.00
1		Spare cartridges (F.# 09-034)	20 each		Fisher	30.00	600.00
1	16	HOT PLATE Variable temp. 220 VAC, plate 25x25 cm (F.# 11-495-20)	2 each		Fisher	168.00	336.00
1	18	EYE WASH STATION Bullard Eye Wash station	4 each	25656	FS	18.95	75.80
1	19	BURN STATION (F.# 10-130-10)	4 each		Fisher	25.00	100.00
1	20	BALANCE, Triple Beam Capacity 600 g w/tare and balance Eqv. to Ohaus Model 750SD	1 each	93488		89.00	89.00
1		With metric weights (2 sets for FRIS)	3 sets	93519	FS	24.00	72.00
1	21	HANGING BALANCE 15 Kg capcity/pan	1 each	93483	FS	317.00	317.00
1	22	BALANCE, Solution Capacity 20 kg. eqv.to Ohaus Model 1119D (F.# 02-100D)	1 each		Fisher	600.00	600.00

25 LIGHT METER, direct reading light meter for light intensity measurements	1	??		
28 THERMOMETER, Minimum-maximum Taylor or similar in deg. C. (F.S.# 89204)	6 each	89204 FS	20.00	120.00
29 THERMOMETER, pocket/case, -10 +110C	2 each	89121 FS	8.45	16.90
33 SOIL SAMPLERS, tube type Complete (F.S.# 77015)	2 each	77015 FS	52.00	104.00
34 SOIL SAMPLERS, auger type				
Soil auger, regular head, screw, 3 1/4"	1 each	77427 FS	80.00	80.00
Soil auger, dutch auger head, screw	1 each	77435 FS	116.00	116.00
Soil auger, extension, 4'	3 each	77443 FS	37.50	112.50
Soil auger handle	2 each	77446 FS	16.50	33.00
35 SOIL CORE SAMPLER 2"x2"	1 each	77455 FS	188.00	188.00
Soil retainer rings 1"	24 each	77456 FS	1.35	32.40
Soil retainer rings 2"	24 each	77457 FS	1.85	44.40
Plastic cylinder caps for cores	100 each	77458 FS	0.25	25.00
38 MAGNIFIER, hand lens				
10x (F.S. # 61280)	2 each	61280 FS	19.00	38.00
20x (F.S.# 61300)	2 each	61300 FS	23.00	46.00
41 WIND SPEED RECORDER,Weathertronics Model	1 each	92505 FS	1415.00	1415.00
Wind speed chart paper, 1 mo. m/s	24 each	92506 FS	17.00	408.00
42 EVAPORATION STATION, metric	1 each	92577 FS	480.00	480.00
Eqv. to Weathertronics Model 6820B				0.00
with ### METRIC ### hook gauge (FS# ???	1 each ??	FS		0.00
43 FIREWEATHER KIT (F.S.# 89088)	1 each	89088 FS	99.00	99.00
				0.00
44 FUEL MOISTURE SCALE	1 each	89070 FS	240.00	240.00
Eqv. to (F.S.# 89070), complete w/	1 each	89069 FS		0.00
support (F.S.# 89069) and moisture	1 each	89071 FS		0.00
sticks (F.S.# 89071).				0.00
45 RAIN GAUGE, recording	1 each	92555 FS	1290.00	1290.00
instruments and shelter	1 each	89142 FS	339.00	339.00
Cable 50 ft. (92519)	1 each	92519 FS	25.00	25.00
Replacement Pens 4 (FS 92605)	1 each	92605 FS	10.00	10.00
Charts 7 day 2 packs (92558)	2 packs	92558 FS	18.00	36.00
45 METEOROGRAPH (FS 92530	1 each	92530 FS	990.00	990.00
Pens 2each (FS 92605)	2 each	92605 FS	10.00	20.00
Charts 2 each (FS 92478)	2 packs	92478 FS	18.00	36.00
47 STANDARD RAIN GAUGE, metric scale	2 each	89048 FS	169.00	338.00
Rain guage, 9 "cap., manual read				0.00
48 PYRANOGRAPH Belfort, battery powered	1 each	94971 FS	966.00	966.00
Charts for pyranographs, weekly, 100/pac	1 each	94973 FS	19.00	19.00

49 WIND RECORDER	1 each	92505 FS	1415.00	1415.00
Charts	24 each	52506 FS	17.00	408.00
52 COMPUTER, IBM PC w/Printer	2 each	??	8500.00	17000.00
IBM or eqv. 386 byte PC with 3 m RAM 40 m HD accessories and software, super VGA color monitor.				
53 COMPUTER, Portable battery operated	2 each	??	550.00	1100.00
Minimum 64 byte capacity portable complete with accessories eqv. to HP 71B				
54 PRINTER	1	??	450.00	450.00
Dot matrix printer for computer				
55 PLOTTER and SOFTWARE for Computer	1	??	1000.00	1000.00
56 CALCULATOR	2	??	50.00	100.00
Four factor , desk top calculator with memory. Built in printer comparable to Casio or Cannon.				
57 SLIDE PROJECTOR, 220 VAC	1	??	500.00	500.00
Eqv. to Kodak Carrasel with 6 spare bulbs, carrying case, and 6 slide trays. 12 Volt ADAPTER for slide projector				
58 OVERHEAD PROJECTOR, 220 VAV !!!!!!	1 each	49769 FS	275.00	275.00
Projector complete with film roll	1 each	49766 FS	49.00	49.00
adapter, carrying case and gross of photocopy transparencies, 2 spare bulbs				
59 PROJECTION SCREEN	1 each	94635 FS	170.00	170.00
Screen size 1.5x2 meter, tripod stand.				
60 CAMERA, 35 mm SLR	2 each	??	1000.00	2000.00
Complete with case, flash, tripod and 50 mm and 35-80 mm zoom lens. Slide copier attachment and microscope adapter to be included with one. Minolta or eqv. Zoom lens (1) 75 - 110 mm				
61 PHOTOCOPY MACHINE - Table top full sheet for one year supply	1 each	??	1000.00	1000.00
62 BLUEPRINT MACHINE, 220 VAC	1 each	Ben Meadows	995.00	995.00
Azo printer developer, 42" wide eqv. to Teledyne Rotolite 201K42 (Ben Meadows # 011052) and Diazo paper 42"x50 yds. (B.M. # 011242) 2 rolls.				
63 TRANSFORMERS, Step down	1	??	1000.00	1000.00
Two sets of 6. 1-2000 VA, 1-1000, 2-500, 2-250 for 220V to 110V.				
65 PLANIMETER	1 each	45040 FS	230.00	230.00
Eqv. to K&E adjustable arm (F.S. #45060)				

1					
1	68 STEREOSCOPE, pocket model	2 each	51154 FS	24.00	48.00
1	(F.S.# 51154)				
1					
1	69 STEREOSCOPE, mirror model	1 each	50999 FS	92.00	92.00
1	(F.S.# 50999)				0.00
1					
1	70 STRETCHER	1 each	25072 FS	85.00	85.00
1					
1	71 FIRST AID KIT, model 8109	4 each	25112 FS	14.00	56.00
1	Model 8163	1 each	25117 FS	100.00	100.00
1					
1	73 LABEL MAKER embossing machine, plastic	2 Each		24.00	48.00
1	Label maker tapes, various colors	50 Rolls		2.00	100.00
1					
1	77 BINOCULARS, Field				
1	Cougar 704 10x50 Waterproof	1 each	91165 FS	110.00	110.00
1	Allsport 701 7x35 Waterproof	1 each	91169 FS	123.00	123.00
1					
1	80 ALTIMETER, Thommen TX, range to 6000 m	2 each	43318 FS	210.00	420.00
1					
1	81 COMPASS	2 each	37010 FS	65.00	130.00
1	Suunto Model KB14 w/case (F.S.# 37010)				
1					
1	82 CLINOMETER	2 each	43830 FS	72.00	144.00
1	Suunto Model PM5/360PC w/case				
1					
1	86 DIAMER TAPE, metric Lufkin to 64 cm dia	2 each	59505 FS	12.50	25.00
1					
1	87 DIAMETER TAPE, metric to 244 cm dia.	1 Each	59525 FS	37.25	37.25
1					
1	88 BARK GAUGE, metric	1 each	59672 FS	54.00	54.00
1	With holster (F.S.# 59672, 59675)	1 each	59675 FS	10.00	10.00
1					
1	89 RIGHT ANGLE PRISM double	1 each	59036 FS	70.00	70.00
1					
1	92 TAPE MEASURE, metric 30 meter	2 each	39766 FS	44.00	88.00
1					
1	93 MEASURING TAPE, Lietz, nylon/steel, 60 m	1 each	39768 FS	70.00	70.00
1					
1	94 HARD HAT				
1	Hardhat, Bullard 5100, yellow	5 each	24581 FS	6.50	32.50
1					
1	95 PLANT PRESS	2 each	53739 FS	29.00	58.00
1	Drier papers, 12/pack	10 pack	53740 FS	3.00	30.00
1	Ventilator papers, 12/pack	5 pack	53741 FS	4.75	23.75
1					
1	96 INSECT NET				
1	Insect nets, 15"	1 each	53746 FS	22.95	22.95
1	Replacement insect netting	1 each	53748 FS	6.25	6.25
1					
1	97 INSECT NET	1 each	53747 FS	25.00	25.00
1	Replacement insect netting	1 each	53752 FS	8.00	8.00
1					
1	100 GENUS COVER box/100	200 each	53759 FS	25.00	5000.00
1	(F.S.# 53759)				
1					
1	106 SNAKE BITE KIT	4 each	25600 FS	5.00	20.00

1						
1	107 SNAKE BITE FREEZE KIT	4 each	25526	FS	15.00	60.00
1						
1	108 PLASTIC FLAGGING					
1	Flagging, Blue, 12 rolls/carton	2 Carton	57910	FS	12.00	24.00
1	Flagging, Orange, 12 rolls/carton	2 Carton	57880	FS	12.00	24.00
1	Flagging, Red, 12 rolls/carton	2 Carton	57890	FS	12.00	24.00
1	Flagging, Yellow, 12 rolls/carton	2 Carton	57900	FS	12.00	24.00
1	Flagging, White, 12 rolls/carton	2 Carton	57920	FS	12.00	24.00
1						
1	111 FIELD BOOKS, Write-in-rain 12/pack 5x7"	4 packs	49342	FS	24.95	99.80
1						
1	112 DESSICATOR CABINET fISHER 08-647-24	1 Each		Fisher	252.00	252.00
	52913.5	SUB-TOTAL #1 PRIORITY				
	2 CONDUCTIVITY/SALINITY METER	1 each	76178	FS‡	559.00	559.00
	Portable multiple range, battery opera-	1 each	56179	FS	129.00	129.00
	ted meter eqv. to YSI Model 33 w/probe			‡Forestry Suppliers		
	3 WILEY CUTTING MILL	1 each		Fisher	1200.00	1200.00
	Grinding mill for vegetative material					
	eqv. to F.# 08-338-1 if 220 VAC.					
	Complete with spare blades, etc.					
	7 SHAKER, Reciprocal	1 each		Fisher	960.00	960.00
	Variable speed shaker for 220 VAC.					
	(F.# 14-262-267).					
	8 SEIVES					
	Seive, std., brass, 8" dia. No.10	1 each	53700	FS	39.25	39.25
	Seive, std., brass, 8" dia. No.18	1 each	53702	FS	39.25	39.25
	Seive, std., brass, 8" dia. No.35	1 each	53704	FS	39.25	39.25
	Seive, std., brass, 8" dia. No.60	1 each	53706	FS	39.25	39.25
	Seive, std., brass, 8" dia. No.80	1 each	53707	FS	39.25	39.25
	Seive, std., brass, 8" dia. No.120	1 each	53708	FS	39.95	39.95
	Seive pan 8", brass	1 each	53712	FS	19.75	19.75
	Seive cover 8", brass	1 each	53714	FS	11.25	11.25
	9 SEIVE SET, plastic w/pan & lid, 6 3/4x3"	2 each	53715	FS	54.50	109.00
	(all brass and one plastic set for FRIS)		53716	FS	28.25	
	10 DISSECTING KIT	6 each		Fisher	41.00	246.00
	Botanical set (F.# 08-845).					
	11 SOIL TEST KIT	1 each	77173	FS	199.00	199.00
	Rapid LaMotte test kit with one refill	1 each	77174	FS	58.00	58.00
	12 VACUUM PUMP	1 each		Fisher	1020.00	1020.00
	Complete 220 VAC with accessories, oil,					
	vacuum line and assorted fittings.					
	(Fisher # 01-182-6)					
	13 [illegible]	[illegible] each		Fisher	205.00	410.00

(F.# 11-495-60)					
23 TURBIDITY METER, Portable	1		Fisher	915.00	915.00
(F.# 15-393-15)					
24 PHOTOMETER, Mini SPEC-20	1		Fisher		
26 WATER LEVEL INDICATOR	2 each	90801	FS	960.00	1920.00
Recording Metric model w/ float similar					
to Stevens Type F. Include clock drive	2 each	90799	FS	385.00	770.00
(90799), 2 box F4 charts (90843), one	2 each	90843	FS	26.00	52.00
metric 1:2 gage scale,375mm float pulley	2 each	90846	FS	60.00	120.00
for beaded line, 6-meter beaded float	2 each	90879	FS	11.00	22.00
line,127mm dia. copper float. FS (90801)	2 each	90865	FS	65.00	130.00
Float Pully (90846), Beaded line 6 meter	2 each	90826	FS	60.00	120.00
End hooks (90879), Float (90865)	10 each	90875	FS	4.00	40.00
Timer (90799), Guage scale (90826)					
Pens-10 each (90875)					
27 WATER FLOW METER	1 each	94460	FS	186.00	186.00
30 DISOLVED OXEGEN METER	1 each		Fisher	500.00	500.00
Complete with probe (F.# 13-298-76 and					
13-299-43)					
31 B.O.D. METER	1 each		Fisher	987.00	987.00
Complete eqv. to Wheaton Model B299					
(F.# 13-299-351)					
32 SOIL COLOR CHART, Munsell	2 each	77341	FS	80.00	160.00
Complete w/ tropical and submerged soil	2 each	77342	FS	10.00	20.00
color pages (F.S.# 77341, 77342, 77343,	2 each	77343	FS	10.00	20.00
and 77344)	2 each	77344	FS	10.00	20.00
36 POCKET PENETROMETER	1 each	77114	FS	43.00	43.00
37 THERMOMETER, soil	2 each	89238	FS	35.00	70.00
2 ea.6" (F.S.# 89238),12" (F.S.# 89240)	2 each	89240	FS	43.00	86.00
and 24" (F.S.# 89242)	2 each	89242	FS	49.00	98.00
39 GOGGLES, plastic safety	4 each	23332	FS	5.00	20.00
40 HYDROTHERMOGRAPH	2 each	92544	FS	530.00	1060.00
Weathertronics Hi Q w/replacement pens	4 each	92605	FS	11.00	44.00
replacement hair bundle	2 each	62613	FS	64.00	128.00
50 TAPE RECORDER, battery with blank tapes	2 each		??	50.00	100.00
Blank tapes	24 each		??	2.00	48.00
51 CAMCORDER, complete w/editor etc.	1 each		??	3000.00	3000.00
Blank tapes	24 each			2.00	48.00
51 COLOR MONITOR/PLAYER	1 each		??	1000.00	1000.00
Zenith AC/DC or equivalent					
64 LETTERING SET	1 each	45396	FS	332.00	332.00
Complete (F.S.# 45396)					

66 DRAWING BARS, parallex (F.S.# 49189)	2 each	49189 FS	5.00	10.00
67 MAP MEASURER, Peco pocket model (F.S.# 45240)	2 each	45240 FS	24.00	48.00
72 VOICE AMPLIFIER, portable 20 watt, weather proof, 12 V	1 each	29128 FS	193.00	193.00
74 GRASS/BRUSH CUTTER	2 each	67200 FS	399.00	798.00
Gasoline powered heavy duty brush blades	6 each	67255 FS	17.00	102.00
75 LEVELING RODS Telescoping metric scale (F.S.# 43260)	1 each	43260 FS	130.00	130.00
76 LEVELING ROD, telescoping, fiberglass 7	1 each	39681 FS	189.00	189.00
78 DRAFTING MACHINE	1 each	49172 FS	295.00	295.00
Eqv. to Vemco Model V w/std. head (F.S.# 49172) and 18" scale (F.S.#48284)	1 each	48284 FS	18.00	18.00
79 DRAFTING/LIGHT TABLE 40 x 36"	1 each	49363 FS	620.00	620.00
83 TREE MARKING GUN Eqv. to Idico Model (F.S.# 55808)	2 each	55808 FS	36.00	72.00
84 SWEDISH TREE LADDER	2 each	91077 FS	245.00	490.00
Complete w/feet (F.S.# 91077, 91076)	1 pair	91076 FS	32.00	32.00
85 TREE CALIPER 80 cm	1 each	59730 FS	98.00	98.00
90 METRIC DIAL CALIPER, plastic	2 each	59591 FS	25.50	51.00
91 INCREMENT BORER, Suunto One each 12"	1 each	63161 FS	105.00	105.00
98 STANDARD INSECT BOX	10 each	53800 FS	8.00	80.00
99 HERBARIUM CABINET (F.S.# 53811)	1	53811 FS	532.00	532.00
101 BACK PACK SPRAYER	2 each	13195 FS	90.00	180.00
Eqv.to Solo Model 425 (F.S.# 13195) w/ pressure gauge	2 each	13164 FS	30.00	60.00
102 PRUNING SAW				
Tree pruner, 12', model312T	2 each	81150 FS	48.75	97.50
Blades, tree pruner, replacement	4 each	81038 FS	8.20	32.80
103 HAND PRUNER, Corona model 80	2 each	81200 FS	21.25	42.50
104 PUMPS, back pack fire pump	10 each	85700 FS	107.95	100.00
105 TIMBER CARRIER (F.S.# 75014)	1	75014 FS	43.00	43.00
109 TAGS, aluminum 500/box	4 Box	57170 FS	15.25	61.00

110 COUNTER, tally meter	2 Each	53030 FS	11.50	23.00

75129.5 TOTAL US $

Balai Penelitian Kehutanan Samarinda - Cabang Bukit Baka/Raya

Bukit Baka Chemicals list, 1991

Item No.	Qty	Pack	Item, specs.	Fisher Cat. No.	Unit Price	US $ Total
1	1	each	AMMONIUM ACETATE, ACS, crystal, 10 kg	A637-10	221.80	221.80
2	1	case	AMMONIUM HYDROXIDE, ACS, 6X2.5 l	A669S-212	93.10	93.10
3	1	each	AMMONIUM NITRATE, ACS, crystal, 500 g	A676-500	18.35	18.35
4	1	each	AMMONIUM PHOSPHATE, diabasic, 6X500 g	A-686-500	157.70	157.70
5	1	each	AMMONIUM PHOSPHATE, monobasic, 6X500 g	A-684-500	131.85	131.85
6	1	each	AMMONIUM SULFATE, primary standard, 500 g	A393-500	17.70	17.70
7	1	each	BROMCRESOL GREEN, ACS, 5 g	B383-5	56.95	56.95
8	1	pack	BUFFER PAK, pH 4, 7, 10, 6/pack	SB105	154.75	154.75
9	1	each	CALCIUM CARBONATE, ACS, powder, 500 g	C64-500	65.35	65.35
10	4	each	METHYL ALCOHOL, ACS, 4 l	A412SK-4	30.45	121.80
11	2	case	HYDROCHLORIC ACID, ACS, 6X2.5 l safe cote	A-144S-212	99.90	199.80
12	2	case	HYDROGEN PEROXIDE, ACS, 50% stabilized, 6X	H341-500	126.05	252.10
13	1	each	METHYL RED, ACS, sodium salt, 10 g	M301-10	39.00	39.00
14	2	case	NITRIC ACID, ACS, 6X2.5 l safe cote	A-200S-212	127.25	254.50
15	1	each	PHOSPHORIC ACID, ORTHO, ACS, 85% 6X1 l/cas	A-242-1	122.10	122.10
16	2	case	POTASSIUM CHLORIDE, ACS, crystal, 6X500 g/	P217-500	77.50	155.00
17	1	each	POTASSIUM NITRATE, certified, crystal, 500	P263-500	29.70	29.70
18	1	each	POTASSIUM PERMANGANATE, ACS, crystal, 500	P-279-500	27.55	27.55
19	1	each	POTASSIUM PHOSPHATE, primary std., 500 g	P-382-500	31.10	31.10
20	1	each	POTASSIUM SULFATE, ACS, crystal, 500 g	P304-500	27.50	27.50
21	1	each	SILVER NITRATE, ACS, crystal, 25 g	S181-25	43.75	43.75
22	1	each	SODIUM CARBONATE, ACS, anhydrous, 500 g	S-263-500	20.00	20.00
23	1	each	SODIUM CHLORIDE, ACS, 500 g	S271-500	10.70	10.70
24	2	case	SODIUM HYDROXIDE, ACS, PELLET, 6X500 g	S318-500	71.85	143.70
25	1	case	SODIUM HYPOCHLORITE, solution, 6X1 l	SS-290-1	42.90	42.90
26	1	case	SODIUM PHOSPHATE, dibasic, anhydrous, ACS,	s-374-500	106.95	106.95
27	1	case	SODIUM PHOSPHATE, monobasic, anhydrous, AC	S-369-500	166.95	166.95
28	1	each	SULFURIC ACID, 1 N solution, 6X1 l	SA212-1	48.05	48.05
29	2	case	SULFURIC ACID, ACS, 6X2.5 l safe cote	A300S-212	128.60	257.20
30	2	case	ACETIC ACID, glacial, 6x1 L case, safe cot	A-38S-500	78.80	157.60
31	1	case	ACETONE, ACS, 6X1 l case	A18-1	57.70	57.70
32	1	each	ALUMINON, ACS, crystal, 25 g	A-546	56.30	56.30
33	1	each	ALUMINUM METAL, ACS, wire, 500 g	A557-500	62.70	62.70
34	1	each	ALUMINUM, Ref. Std. for AAS, 500 ml	SA-442-500	29.15	29.15
35	1	box	AMINO NAPTHOL SULFONIC ACID, 12 pack/box	A974-500	35.15	35.15
36	1	each	AMMONIUM CHLORIDE, ACS, 500 g	A661-500	18.50	18.50
37	1	each	AMMONIUM FLUORIDE, ACS, cystal, 500 g	A665-500	83.20	83.20
38	1	each	AMMONIUM MOLYBDATE, ACS, crystal, 500 g	A674-500	115.75	115.75
39	1	each	AMMONIUM VANADATE, meta, 500 g	A-7141	55.70	55.70
40	1	each	ANTIMONY POTASSIUM TARTRATE, certified, 50	A-865-500	61.50	61.50
41	1	each	ASCORBIC ACID, ACS,crystal, 100 g	A-61-100	25.30	25.30
42	1	each	BARIUM CHLORIDE, dihydrate, ACS, crytal, 5	B- 34-500	28.50	28.50
43	1	each	BARIUM DIPHENOLAMINE SUFONATE, certified,	B38- 25	198.00	198.00
44	1	each	BORIC ACID, ACS, crystal, 500 g	A73-500	22.90	22.90
45	1	each	CALCIUM "	SC-191-500	19.65	19.65
46	1	each	CALCIUM CHLORIDE, ACS, dihydrate, 500 g	C79-500	21.20	21.20
47	1	each	CHROMIUM "	SC-192-500	19.65	19.65
48	1	each	CITRIC ACID, ACS, anhydrous, 500 g	A-940-500	19.55	19.55
49	1	each	COBOLT "	SC-193-500	19.65	19.65
50	1	each	COPPER "	SC-194-500	19.65	19.65

51	1 each	CUPRIC SULFATE, ACS, crystal, 500 g	C493-500	29.25	29.25
52	1 each	EDTA ACID, ACS, 500 g	E478-500	40.50	40.50
53	1 case	FERROUS AMMONIUM SULFATE, ACS, crystal, 6X	I-77-500	248.55	248.55
54	1 each	FERROUS SULFATE, ACS, crystal, 6X500 g	I-146-500	29.60	29.60
55	1 each	IRON "	SI-124-500	19.65	19.65
56	2 each	LANTHANUM CHLORIDE, certified, 50 g	L-9-50	32.55	65.10
57	1 each	MAGNESIUM "	SM-51-500	19.65	19.65
58	1 each	MAGNESIUM OXIDE, ACS, powder, 500 g	M51-100	294.40	294.40
59	1 each	MAGNESIUM SULFATE, ACS, crystal, 500 g	M63-500	28.40	28.40
60	1 each	MANGANESE "	SM-81-500	19.65	19.65
61	1 each	NITROPHYNOL (para), crystal, 500 g	1029560	25.05	25.05
62	1 each	N-(1 NAPTHYL) ETHYLENE DIAMINE HCl, 25 G	1175025	49.50	49.50
63	1 each	OXALIC ACID, ACS, crystal, 500 g	A-219-500	39.40	39.40
64	1 each	PHENANTEROLINE, (1,10) ACS, 10 g	P-70-5	40.50	40.50
65	1 each	PHENOL, ACS, crystal, 500 g	A-92-500	46.15	46.15
66	1 each	PHENYLANTHRANILIC ACID, (N), 10 g	1139393	16.90	16.90
67	1 each	PHYNOLTHALEIN, ACS, 100 g	P79-100	21.15	21.15
68	1 each	POTASSIUM "	SP-351-500	19.65	19.65
69	1 each	POTASSIUM DICHROMATE, ACS, 500 g	P-188-500	57.35	57.35
70	1 case	POTASSSIUM HYDROXIDE, ACS, pellet, 6X500 g	P-250-500	84.20	84.20
71	1 each	PYROGALLOL, ACS, crystal, 100 g	A-263-100	62.10	62.10
72	1 each	SALICYLDEHYDE, reagent grade, 500 ml	A281-500	159.75	159.75
73	1 each	SAND, seasand, washed, 500 g	S-25-500	10.10	10.10
74	2 pack	SELENIUM CATALYST, kjeltabs, 1000/pack	13-159B	63.00	126.00
75	1 each	SODIUM "	SS-139-500	19.65	19.65
76	1 each	SODIUM BICARBONATE, USP, 3 kg	S631-3	26.65	26.65
77	1 each	SODIUM CITRATE, certified, granular, 500 g	S279-500	17.50	17.50
78	1 each	SODIUM COBALTINITRATE, ACS, 100 g	S-280-100	37.35	37.35
79	1 each	SODIUM DITHIONATE, purified, 100 g	S290	54.10	54.10
80	1 each	SODIUM LAURYL SULFATE, powder, 500 g	S529-500	38.80	38.80
81	1 case	SODIUM METAPHOSPHATE, purified, powder, 6X	s-333-500	55.70	55.70
82	1 each	SODIUM NITRATE, ACS, crystal 500 g	S-343-500	36.55	36.55
83	1 each	SODIUM NITRITE, ACS, crystal 500 g	S-347-500	36.50	36.50
84	1 each	SODIUM NITROPRUSSIDE, ACS, crystal, 100 g	S-350-100	31.30	31.30
85	1 each	SODIUM OXALATE, ACS, 100 g	S-487-500	54.40	54.40
86	1 each	SODIUM SALICYLATE, certified, powder, 500	S395-500	42.85	42.85
87	1 each	SODIUM SULFATE, ACS, anhydrous, 500 g	S421-500	14.05	14.05
88	1 each	SODIUM SULFITE, ACS, anhydrous 500 g	S447-500	12.40	12.40
89	1 each	SODIUM TARTRATE, ACS, crystal, 100 g	S435-100	19.55	19.55
90	1 each	SODIUM (di) EDTA, ACS, crystal, 500 g	S-311-500	57.85	57.85
91	1 each	STANNOUS CHLORIDE, ACS, crystal, 500 g	T-142-500	86.25	86.25
92	1 each	STRONTIUM CHLORIDE, ACS, crystal, 500 g	S541-500	103.00	103.00
93	1 each	SUCROSE, ACS, crystal, 500 g	S5-500	17.85	17.85
94	1 each	SULFANILAMIDE, certified, 100 g	O-4525-100	23.85	23.85
95	1 each	ZINC "	SZ-13-500	19.65	19.65
96	1 each	ZINC OXIDE, ACS, powder, 500 G	Z52-500	20.95	20.95
			TOTAL		6524.50

Balai Penelitian Kehutanan Bukit Baka/Raya

Supplies list, 1991

Item No.	Qty	Pack	Item, specs.	Fisher Cat. No.	Unit Price	Total
1	1	roll	Aluminum foil,76mmx96m	01-213	12.00	12.00
2	1	set	Balance calibrating weight set	02-231	350.00	350.00
3	2	box	Weigh.dish, box 500, size 67mm	02-202B	42.50	85.00
4	1	case	Beaker, 50 ml, 48 pc/case	02-540G	68.16	68.16
5	1	case	Beaker, 100 ml, 48 pc/case	02-540H	72.96	72.96
6	1	case	Beaker, 250 ml, 48 pc/case	02-540K	68.16	68.16
7	1	case	Beaker, 600 ml, 36 pc/case	02-540M	77.04	77.04
8	1	case	Beaker, 1000 ml, 24 pc/case	02-540P	97.68	97.68
9	1	case	Beaker,2000 ml, 8 pc/case	02-540R	64.56	64.56
10	4	case	Bottle, Reagent 250 ml, 6/case	03-439-51B	26.95	107.80
11	2	case	Bottles, Nalgene, 1 l.24/case	02-925F	66.00	132.00
12	2	case	Bottle, Nalgene, 10 l. 6/case	02-963A	258.84	517.68
13	4	packs	Bottle, Dropping, 60 ml 6/pack	03-004	6.00	24.00
14	1	case	Bottle, Glass Drp.,60 ml 36/ca	02-983B	43.00	43.00
15	1	pack	Bottle, Wash 24/case	03-409-22C	58.00	58.00
16	1	pack	Beaker Brush, 12/pack	03-555	70.00	70.00
17	1	pack	Flask Brush, 12/pack	03-570B	60.00	60.00
18	1	pack	Test Tube Brush, 12/pack	03-578	29.00	29.00
19	1	case	Buret, Nalgene 50 ml, 4 case	03-705C	131.32	131.32
20	1	case	Buret, Nalgene 100 ml, 4 case	03-705D	142.48	142.48
21	4	each	Buret, 3-way filling, 50 ml	03-745B	51.00	204.00
22	2	pack	Buret, Dispensing Auto-100 ml	03-844B	190.00	380.00
23	2	each	Buret Stand	14-688	60.00	120.00
24	6	each	Burner, LP gas	03-962P	30.00	180.00
25	6	each	Burner, Alcohol	04-245AA	3.71	22.26
26	1	pack	Burner Wicks 12/pack	04-250	2.50	2.50
27	6	each	Clamps, Utility	05-769	18.00	108.00
28	1	pack	Clamps, Hose 10/pack	05-870A	17.50	17.50
29	1	pack	Cork Borer Set	07-850-10	113.00	113.00
30	1	each	Cork Borer Sharpener	07-865	33.00	33.00
31	1	case	Crucibles, Porc.30 ml 36/case	07-965E	115.50	115.50
32	36	each	Crucible Covers	07-970F	3.98	143.28
33	4	each	Filtering crucibles	08-236-1C	12.91	51.64
34	6	each	Measuring Cylinder PP 10 ml	08-572-6A	2.85	17.10
35	6	each	Measuring Cylinder PP 25 ml	08-572-6B	3.35	20.10
36	6	each	Measuring Cylinder PP 50 ml	08-572-6C	4.25	25.50
37	6	each	Measuring Cylinder PP 100 ml	08-572-6D	5.15	30.90
38	6	each	Measuring Cylinder PP 250 ml	08-572-6E	6.85	41.10
39	6	each	Measuring Cylinder PP 500 ml	08-572-6F	9.50	57.00
40	4	case	Measuring Cyl. PP 1000 ml 6/ca	08-572-6G	71.00	284.00
41	1	each	Desiccant, Indicator 8 mesh,51	07-578-3B	43.50	43.50
42	1	case	Desiccant, 8 mesh, 4/case	07-5774B	59.50	59.50
43	4	each	Dispensers, Repipet III, 20 ml	13-687-102	73.25	293.00
44	2	each	Dissecting Set	08-855	22.00	44.00
45	5	case	Filter Paper, What. 54, 9cm. 5	09-868A	51.50	257.50
46	10	case	Filter Paper, What. 2, 9cm. 5/	09-810D	15.00	150.00
47	5	case	Filter Paper, What. 5, 9cm. 5/	09-830A	23.25	116.25
48	5	case	Filter Paper, What. 42, 9cm.5/	09-855B	51.50	257.50
49	1	case	Hand Vacuum Pump, 4/case	01-070	187.32	187.32
50	1	pack	Flask, Erlenmeyer 25 ml 12/pac	10-040B	26.80	26.80

51	1 case	Flask, Erlenmeyer 50 ml 48/cas	10-040C	87.84	87.84
52	1 case	Flask, Erlenmeyer 125 ml 48/ca	10-040D	84.96	84.96
53	1 case	Flask, Erlenmeyer 250 ml 48/ca	10-040F	87.84	87.84
54	1 case	Flask, Erlenmeyer 500 ml 36/ca	10-040H	82.80	82.80
55	1 pack	Flask, Erlenmeyer 1000 ml 6/pa	10-040K	27.59	27.59
56	2 case	Flask, Nalgene Filter 500 ml 1	10-182-50A	78.00	156.00
57	1 case	Flask, Vol. Kimax 50 ml 12/cas	10-199C	84.72	84.72
58	1 case	Flask, Vol. Kimax 100 ml 12/ca	10-199D	97.20	97.20
59	1 case	Flask, Vol. Kimax 200 ml 12/ca	10-199E	111.48	111.48
60	1 case	Flask, Vol. Kimax 500 ml 12/ca	10-199G	145.92	145.92
61	1 case	Flask, Vol. Kimax1000 ml 6/cas	10-199H	93.54	93.54
62	1 case	Flask, Vol. Kimax 2000 ml 4/ca	10-199J	96.28	96.28
63	1 case	Funnels, Filter, Poly 36/case	10-347D	41.04	41.04
64	2 case	Funnel,Buchner, Poly 4/case	10-362D	30.08	60.16
65	1 pack	Funnel, Powder, Poly 12/pack	10-348B	17.52	17.52
66	1 pack	Filter Adapter Set 6/pack	10-184	17.35	17.35
67	2 each	Glass Tubing Cutter	11-345	10.00	20.00
68	1 bundle	Glass Tubing 25# Bundle Assort	11-366-10	167.50	167.50
69	2 pack	Gloves, Disposable Hed. 100/pa	11-394-31B	16.25	32.50
70	2 each	Lubriseal Glass Lub 75 g tube	14-635M	10.35	20.70
71	2 each	Hydrometer, Soil	14-331-5C	22.50	45.00
72	4 each	Lable Tape 13mmx13m White	11-880A	2.50	10.00
73	4 each	Lable Tape 13mmx13m Red	11-880E	2.50	10.00
74	4 each	Lable Tape 13mmx13m Blue	11-880G	2.50	10.00
75	4 each	Lable Tape 13mmx13m Green	11-880C	2.50	10.00
76	4 each	Lable Tape 13mmx13m Yellow	11-880B	2.50	10.00
77	1 case	Tape Dispenser, for 13mm tape	11-880-26	9.90	9.90
78	4 each	Magnifier, Tripod 10 X	12-055	10.25	41.00
79	2 gross	Microscope Slides 75x25mm	12-518-100B	10.00	20.00
80	1 pack	Microscope cover slips 1000 pa	12-547	20.50	20.50
81	2 each	Mortar and Pestle, AlumOx 75mm	12-948D	54.62	109.24
82	2 each	Mortar, Porcelain 115mm dia	12-961B	12.43	24.86
83	2 each	Pestal, Porcelain	12-961-5B	9.05	18.10
84	1 pack	Marker Pen 12/pack fine black	13-381	13.50	13.50
85	1 pack	HiTemp Green Marker	13-382-16	11.00	11.00
86	1 case	pHydron Paper 3-5.5 & 6-8	14-650-10J	40.00	40.00
87	1 case	pHydron Paper 1-12	14-850-11B	40.00	40.00
88	4 each	Pipets, vol. 1 ml	13-650B	3.95	15.80
89	4 each	Pipets, vol. 2 ml	13-650C	3.95	15.80
90	4 each	Pipets, vol. 5 ml	13-650F	4.25	17.00
91	4 each	Pipets, vol. 10 ml	13-650L	4.73	18.92
92	4 each	Pipets, vol. 20 ml	13-650N	6.94	27.76
93	4 each	Pipets, vol. 25 ml	13-650P	7.30	29.20
94	4 each	Pipets, vol 50 ml	13-650S	9.74	38.96
95	4 each	Pipets, vol.100 ml	13-650U	13.75	55.00
96	4 each	Pipets, Mohr 1 ml	13-665G	3.80	15.20
97	4 each	Pipets, Mohr 10 ml	13-665H	4.93	19.72
98	4 each	Pipets, Mohr 25 ml	13-665N	7.70	30.80
99	4 each	Pipet Filler, red	13-681-51	18.50	74.00
100	2 pack	Dropper, 1 ml calibrated, 12/p	13-703A	6.50	13.00
101	1	Seives page 979			0.00
102	6 each	Spatula, Wood handle	14-365B	6.00	36.00
103	1 pack	Spatula, Spoonula 6/pack	14-375-10	25.00	25.00
104	1 pack	Stoppers, Rubber #0	14-141A	13.50	13.50
105	2 pack	Stoppers, Rubber #1	14-141B	13.50	27.00
106	1 case	Stoppers, Rubber #5	14-141F	65.50	65.50

107	1 case	Stoppers, Rubber #6	14-141G	65.50	65.50
108	1 case	Stoppers, Rubber #7	14-141J	65.50	65.50
109	2 pack	Stoppers, Rubber #9	14-141L	14.50	29.00
110	6 each	Tripod Base Stand, 50cm	14-675B	35.00	210.00
111	4 each	Funnel Support Arm	14-740	15.50	62.00
112	4 each	Tripods 23cmx15cm	15-300B	17.00	68.00
113	1 pac	Wire Guaze Heating Screen 10/p	15-590B	32.50	32.50
114	4 each	Thermometer -20-150C	14-986C	4.60	13.40
115	3 each	Timer, 60 min interval	06-662-10	22.00	66.00
116	2 each	Timer/stopwatch	14-649-15	25.00	50.00
117	4 each	Tongs, Beaker	02-620	20.50	82.00
118	6 each	Tongs, Lab TFE Coated	15-202-5	8.90	53.40
119	2 each	Tongs, Long Handle, Jumbo	15-207	25.00	50.00
120	1 pack	Triangle,Crucible Heating,51mm	15-260B	36.00	36.00
121	1 pack	Test Tube Kimax 25x150mm 72/pa	14-956K	55.43	55.43
122	1 pack	Test Tube Kimax 20x150mm 72/pa	14-956G	34.31	34.31
123	1 each	Test Tube Rack 20 mm Slant Tub	14-796-5	15.50	15.50
124	1 each	Test Tube Rack 25mm tubes	14-809-28	9.50	9.50
125	1	Test Tube Rack Centro Tubes	Pg 1049		0.00
126	1 pack	Tubing- Vac. 6mm 4m/pack	14-175C	30.00	30.00
127	1 pack	Tubing- Vac. 10mm 4m/pack	14-175E	38.00	38.00
128	1 pack	Tubing Clamp 10/pack	14-198-5B	8.00	8.00
129	1 kit	Tubing, Vinyl Kit 4.8mmID 15m/	14-174-1A	19.50	19.50
130	1 kit	Tubing, Vinyl Kit 6.4mmID 15m/	14-174-1C	24.00	24.00
131	1 kit	Tubing, Vinyl Kit 9.5mmID 15m/	14-174-1G	34.50	34.50
132	1 kit	Tubing, Vinyl Kit 13mmID 15m/k	14-174-1M	39.50	39.50
133	1 case	Vial 20ml glass vial w/cap 500	03-337-4	81.50	81.50
134	1 each	Methods Manual/Water	15-413-3	106.00	106.00
135	1 case	Kimwipes 11x22cm 60 pack/case	06-666A	99.00	99.00
136	1 each	Parafilm Wrap 10mmx76m roll	13-374-12	24.00	24.00
137	1 case	Slide Staining Jar Poly 12/cas	08-815-10	31.50	31.50
138	1 case	Innoculating Needles w/handle	13-086	30.00	30.00
			TOTAL		9695.33

SAMARINDA 7 November - 9 December 1991
[fris191.doc]

Equipment Installation, Training and Additional Needs at Forest Research Institute Samarinda (FRIS)

Roy Voss, ARD/NMRP/USAID/GOI

Jakarta, Indonesia

EXECUTIVE SUMMARY:

Equipment and supplies provided to the Forestry Research Institute Samarinda (FRIS) by the Applied Agricultural Research Project of USAID/GOI were received in late 1990 and 1991. Just over US$200 worth of material was received and assistance has been given to install and calibrate the equipment and provide some training of local staff on the equipments use and care.

While nearly all the equipment was complete and in good condition there were a few missing manuals, substitutions of recommended equipment with inappropriate models and machines and in a few instances missing and/or broken parts. Unfortunately, a large requested order for supplies and chemicals (everything that was on a general list of laboratory needs developed by Dr. Bob Luce for AARP in 1986) was included on the order requests submitted, but was NOT furnished for the FRIS labs. Because of this oversight (who, when and where responsibility falls is unknown) the laboratories are in the position of having none of the basic day to day supplies and chemicals with which to work!
These things, like test tubes, beakers, filters, basic chemicals, etc. are desperately needed so that the equipment can be used.

In addition, some modification is needed on the laboratories themselves, such as increasing the electrical service supply and building additional benches and cabinets.

Two notable omissions in equipment to be supplied were made.

Although an ATOMIC ABSORPTION SPECTROPHOTOMETER was listed number 1 on the specification lists submitted for ordering in 1986 it was apparently NOT ordered for FRIS. This is an expensive, but necessary, instrument for all basic soils, plant nutrition, hydrology, conservation, and ecological studies!

In wood products, while FRIS did not really expect all of the equipment requested (Robert Gilmore of North Carolina State University Wood Products Lab did a fine job making the recommendations as part of a short term consultancy in November 1986), it was expected that some testing equipment would be received. NO forest products testing equipment was received.
Only some woodworking shop tools and those were not quite appropriate for forest products research.

Lists of equipment received and the present status is presented in the report. In addition, lab modifications are described and additional lab equipment and supplies needed are listed.

INTRODUCTION:

In 1986 the Forest Research Institute at Samarinda officially opened it buildings, expecting to receive research supplies and equipment from the Applied Agricultural Research Project of USAID/GOI. Much effort and planning had been done to assure that needed research materials would be secured for the Institute to provide timely and accurate forestry research results.

In 1990-91 these materials were finally received. Some of them at least! Because of the time lag and lack of trained laboratory management staff on the Institute, assistance was requested from the Natural Resources Management Project (ARD/NRMP) to set up, calibrate and to some extent train Institute staff in the proper operation and care of the equipment.

DISCUSSION:

Equipment Orders and Receipts:

Attached is a complete listing of the original request for equipment, chemicals, and supplies originally requested by FRIS. Mid-year in 1986 a cut in the number of items was requested and complied with as indicated in the list and cover letter.

Also attached is a list of the equipment received by the Institute. It indicates the status of the equipment,
items not received that were ordered and the discipline in which the equipment is used. It should be pointed out though, MUCH OF THE EQUIPMENT IS USEFUL IN MANY DIFFERENT DISCIPLINES.

The third listing indicates the general assignment of the various equipment by disciplines. It indicates that equipment-wise, the Institute is now relatively well endowed with the exception of Forest Products. Forest Products received none of the pilot testing equipment or the materials testing instruments that were requested. In addition, the wood working shop tools that were received were designed for commercial continuous use and require 3-phase 220 Volt electrical supply rather that the common 220 Volt single phase which the Institute has.

Listed as number one (1) on the requests was an ATOMIC ABSORPTION SPECTROPHOTOMETER for use in basic soils, plant nutrition, hydrology, conservation, and ecological studies!

Even more notable than the omission of equipment was the exclusion of nearly all the chemicals and basic lab supplies requested (Page 11-18). The omission was the materials that had been identified by Dr. Robert Luce of AARP as ESSENTIALS FOR ANALYTICAL AND GENERAL LABORATORIES and were to be supplied as basic packages to each laboratory in the AARP network!

Because of the time delay in receiving the equipment, and uncertainty over location and installation of equipment, facilities at FRIS have not been amended to accommodate all of the equipment.

The addition of benches and cabinets is required in all laboratories as is the addition of electrical circuits strong enough to handle refrigerators and drying ovens. All fume hoods will require PVC Pipe venting to the outside and the soils lab, with its digester, muffle furnace and distillation apparatus will need special attention.

Also needing special attention is the Forest Products building. It will need three phase 220 Volt electrical service and possibly 250 Amps of total circuit (55 KWatts).

Consideration may also be given to building a new laboratory building between the garage and the Forest Products building.
This should be a two story building dedicated to an herbarium and forest botany lab upstairs with possibly 4 large labs at ground level. Small instrument rooms connecting the larger labs would assist in maintaining the expensive and complicated equipment like balances, analytical instruments such as colorimeter and AAS and similar equipment that needs 24 hour air conditioning. Sketches of this concept will be submitted at a later date.

For now, some of the equipment may be needed at Wanareset in Sambodja (Autoclave/sterilizer, growth chamber and a few other items). The Director and staff should take a realistic view of staffing and needs and distribute the equipment to where it is most needed at the present time.

Additional needs at Samarinda:

A detailed list of additional chemicals and supplies is attached to this report.

Itinerary:

1 November 1991	Depart Gainesville, FLORIDA
3 November 1991	Arrive Jakarta
4-6 November 1991	Consult with ARD, AID, FRI-Bogor, Litbang Kehutanan
7 November 1991	Depart to Samarinda
7 November to 8 December 1991	Forest Research Institute Samarinda Installation, calibration and Training
9 December 1991	Return Jkt.
10-11 December 1991	ARD/NRMP Office, Jkt.
12-17 December 1991	Bukit Baka/Raya Site in Kalamantan Barat (See separate report)
18-20 December 1991	ARD/NRMP Office, Jkt. Write reports
20 December 1991	Depart for USA.

People Consulted:

ARD/NRMP Jkt. office:

Forestry Department GOI:

Manggala Wanabhakti

Pak Rosyid - Travel arrangements ect.
Didi Waryanto - Met in Samarinda
Wartono Kantra - PUSREHUT Met in Sam.

FRI - Bogor

Pak Ombo Sansapradja

Uhaedi Sutisna - Forest Botany

ITTO - Muhammad Kuswanda

USAID

Jerry Bisson

Graham Kerr, Dep. Chief Agric.?

Rosihan Indra

Agus Widyanto

FRI - Samarinda

Pak Tantra and entire staff

Tropenbos - Sambodja, Balikpapan

Willi Smitts

Balai Berkerja Kehutanan (Finnland aid) - Samarinda

Meteorology Station, Pontianak Airport - Pak Sakaraiah

BALAI PENELITIAN KEHUTANAN
SAMARINDA

Equipment Order No. 1

NO.	ITEM NAME, specifications	QTY.	Lab.	Loc.	Ref.#	Notations
1	ATOMIC ADSORPTION SPECTROPHOTOMETER		Soils	***		***NOT RECEIVED***
2	STERILIZER/AUTOCLAVE	1	Biology	4	671	Operating
3	ANALYTICAL BALANCE (1 of 2)	1	Biology	4	672	Operating - 110 Volt!
3	ANALYTICAL BALANCE (1 of 2)	2	Soils	8	672	Operating
4	TOP-LOADING BALANCE (1 of 2)	2	Soils	8	673	Operating
4	TOP-LOADING BALANCE (1 of 2)	1	Biology	4	673	Operating
5	WATER BATH (1 of 2)	1	Biology	4	674	Operating
5	WATER BATH (1 of 2)	1	Sambodja	10	674	Operating
6	CENTRIFUGE	1	Soils	8	675	Operating
7	SPECTROPHOTOMETER	1	Soils	8	676	Operating
8	CONDUCTIVITY/SALINITY METER (1 of 2)	1	Sambodja	10	677	Operating
8	CONDUCTIVITY/SALINITY METER (1 of 2)	1	Soils	8	677	Operating
9	ENVIRONMENTAL CHAMBER	1	Biology	4	678	Operating
10	FLAME PHOTOMETER	1	Soils	8	679	Clinical medical model
11	FREEZER	1	Soils	8	680	Operating
12	SEED GERMINATOR	1	Biology	4	681	Operating
13	disregard					
14	WILEY CUTTING MILL	1	Soils	8	681	Operating
16	KJELDAHL NITROGEN DIGESTOR	1	Soils	8	682	Insufficient electricity
15	INCUBATOR, refrigerated	1	Biology	4	683	Operating
17	NITROGEN DISTILATION UNIT	1	Soils	8	684	Operating
18	MICROSCOPE, Stereo zoom (1 of 2)	1	Pathology	6	685	Operating
18	MICROSCOPE, Stereo zoom (1 Of 2)	1	Biology	4	686	Operating
19	MICROSCOPE, Research (1 of 2)	1	Pathology	6	687	Operating - 110 Volts
19	MICROSCOPE, Research (1 of 2)	1	Sambodja	10	687	Operating - 110 Volts
20	disregard					
21	OVEN, Mechanical convection (1 of 4)	1	Wood Prod	9	688	Operating
21	OVEN, Mechanical convection (1 of 4)	1	Biology	4	688	Operating
21	OVEN, Mechanical convection (1 of 4)	1	Soils	8	688	Operating
21	OVEN, Mechanical convection (1 of 4)	1	Pathology	6	688	Operating
22	pH METER, Digital	1	Soils	8	689	Operating
23	disregard					
24	REFRIGERATOR/FREEZER (1 of 3)	1	Soils	8	690	Operating
24	REFRIGERATOR/FREEZER (1 of 3)	1	Biology	4	690	Operating
24	REFRIGERATOR/FREEZER (1 Of 3)	1	Pathology	6	690	Operating
25	disregard					
26	SHAKER, Reciprocal	1	Sambodja	10	691	Operating
26	SHAKER, Reciprocal	1	Soils	8	691	Operating
27	disregard					
28	SIEVING MACHINE, Laboratory type	1	Soils	8	692	Without seives!
29	disregard					
30	disregard					
31	DISSECTING KIT	6	Pathology	6	693	ok
32	CIRCULAR HYDROTHERMOGRAPH		Wood Prod.	***		***NOT RECEIVED***
33	HYDROTHERMOGRAPH	2	Meteorol.	3	695	Operating and Calibrated
34	SOIL TEST KIT	1	Soils	8	696	Operating

35 disregard					
36 CALIPER, Dial type	4	Wood Prod	9	697	Operating
37 CALIPER, Vernier type	4	Wood Prod	9	698	Operating
38 CALIPER, MICROMETER	4	Wood Prod	9	699	Operating
39 COMPUTER, IBM PC	2	Admin.	1	700	Operating
40 LAPTOP COMPUTER	2	Admin.	1	701	NOT LOCATED AT FRIS!!!
41 PRINTER	2	Admin.	1	702	Operating
42 CALCULATOR	6	Admin.	1	703	110 Volt adapters/battery ok
43 SLIDE PROJECTOR, 220 VAC	1	Admin.	1	704	Operating
44 OVERHEAD PROJECTOR, 220 VAV	1	Admin.	1	705	Operating
45 PROJECTION SCREEN	1	Admin.	1	706	Operating
46 CAMERA, 35 mm SLR	2	Admin.	1	707	Operating
47 MIMEOGRAPH MACHINE NO! SPIRIT DUPLICATOR	1	Admin.	1	708	Not a Mimeograph machine!
48 MICHROFICHE READER	1	Admin.	1	709	Operating
49 BLUEPRINT MACHINE, 220 VAC	1	Admin.	1	710	Operating
50 PHOTOGRAPHIC SLIDE STORAGE		Admin.	***		***NOT RECEIVED***
51 COMPRESSOR	1	Soils	8	712	Operating
52 LAWN MOWER		Admin.	***		***NOT RECEIVED***
53 GRASS/BRUSH CUTTER	3	Admin.	1	714	Operating
54 VACUUM PUMP	1	Soils	8	715	Operating - Broken case
55 pH METER, portable (1 of 2)	1	Biology	4	716	Operating
55 pH METER, portable (1 of 2)	1	Soils	8	716	Operating
56 DEIONIZER	1	Soils	8	717	Operating
57 ENTOMOLOGY CABINET/DRAWERS	1	Pathology	6	718	Operating
58 STIRRER, Magnetic (1 of 2)	1	Soils	8	719	Operating
58 STIRRER, Magnetic (1 of 2)	1	Biology	4	719	Operating
59 BLENDER (1 of 2)	1	Biology	4	720	Operating
59 BLENDER (1 of 2)	1	Soils	8	720	Operating
60 DEHUMIDIFIER	1	Soils	8	721	Operating
62 HOT PLATE, Stirring (1 of 2)	1	Soils	8	722	Operating
62 HOT PLATE, Stirring (1 of 2)	1	Biology	4	722	Operating
61 HOT PLATE (1 of 2)	1	Biology	4	723	Operating
61 HOT PLATE (1 of 2)	1	Soils	8	723	Operating
63 disregard					
64 VIBRATING SPATULA	1	Soils	8	724	Operating
65 EYE WASH STATION	4	Safety	2	725	Operating
66 BURN STATION	4	Safety	2	726	Operating
67 BALANCE, Triple Beam (1 of 4)	1	Pathology	6	727	Operating
67 BALANCE, Triple Beam (1 of 4)	1	Soils	8	727	Operating
67 BALANCE, Triple Beam (1 of 4)	1	Wood Prod	9	727	Operating
67 BALANCE, Triple Beam (1 of 4)	1	Biology	4	727	Operating
68 BALANCE, Solution (1 of 2)	1	Soils	8	728	Operating
68 BALANCE, Solution (1 of 2)	1	Wood Prod	9	728	Operating
69 BOMB CALORIMETER	1	Soils	8	729	Not assembled
70 disregard					
71 FURNACE, Muffle	1	Soils	8	730	Insufficient electricity
72 MICROTOME	1	Biology	4	731	Operating
73 MIXER, Vortex stirrer (1 of 2)	1	Biology	4	732	Operating - 110 Volt!
73 MIXER, Vortex stirrer (1 of 2)	1	Soils	8	732	Operating
74 TIME SWITCH	2	Soils	8	733	Operating
75 TURBIDITY METER, Portable	1	Soils	8	734	Operating
76 TRANSFORMERS, Step down (Set)	2	Soils	8	735	Operating
77 THERMOGRAPH		Soils	8	736	Missing probe!

78 VAPOR PRESSURE OSMOMETER - disregard		Biology			
79 GREEN LEAF METER - disregard		Biology			
80 PLANT MOIST.POTENTIAL TESTER - disregard		Biology			
81 SOLAR METER	1	Meteorol.	3	739	Operating
82 RADIATION METER		Meteorol.	***		***NOT RECEIVED***
83 PHOTOMETER MINI SPEC 20	1	Soils	8	741	Ordered light meter
84 TRANSFER HOOD, Laminar flow	1	Biology	4	742	Operating
85 WATER LEVEL INDICATOR (1 of 4)	1	Soils	8	743	Operating
85 WATER LEVEL INDICATOR (1 of 4)	1	Soils	8	743	Operating
85 WATER LEVEL INDICATOR (1 of 4)	1	Soils	8	743	Operating
85 WATER LEVEL INDICATOR (1 of 4)	1	Soils	8	743	Operating
86 WATER FLOW METER	1	Soils	8	744	Operating
87 TENSIOMETER, Soil test	20	Soils	8	745	Operating
87 TENSIOMETER, Portable Quick Draw	1	Soils	8	746	Operating
88 SOIL PRESSURE MEMBRANE APPARATUS	1	Soils	8	747	Incomplete
89 ANEROID BAROMETER	1	Meteorol.	3	748	Operating
90 DEWPOINT THERMOMETER - disregard					
91 THERMOMETER, Minimum-maximum	6	Soils	8	750	Operating
91 THERMOMETER, Minimum-maximum (2 of 6)	2	Biology	4	750	Operating
92 DISOLVED OXEGEN METER	1	Soils	8	751	Operating
93 B.O.D. METER	1	Soils	8	752	Operating
94 EVAPORATION STATION		Meteorol.	***		***NOT RECEIVED***
95 STILL, Barnstead glass still	1	Soils	8	754	Operating
96 FIREWEATHER KIT	1	Meteorol.	3	755	Operating
97 FUEL MOISTURE SCALE	1	Meteorol.	3	756	Ready to install
98 LEVELING RODS	1	Silvicul.	7	757	Operating
99 RELASCOPE	1	Silvicul.	7	758	Operating
100 BINOCULARS, Field	2	Silvicul.	7	759	Operating
101 DRAFTING MACHINE	1	Drafting	5	760	Operating (1 ruler only)
102 DRAFTING TABLE	1	Drafting	5	761	Operating
103 FUME HOOD, Fiberglass 47 (1 of 3)	1	Pathology	6	763	OK, Needs outside vent
103 FUME HOOD, Fiberglass 47 (1 of 3)	1	Soils	8	763	Operating
103 FUME HOOD, Fiberglass 47 (1 of 3)	1	Biology	4	763	OK, needs outside vent
104 LIGHT TABLE	1	Drafting	5	763	Operating
105 SOIL COLOR CHART, Munsell	2	Soils	8	764	Operating
106 SOIL SAMPLERS, tube type	2	Soils	8	765	Operating
107 SOIL SAMPLERS, bucket type	2	Soils	8	766	Operating
108 SOIL SAMPLERS, auger type	2	Soils	8	767	Operating
109 LETTERING SET	1	Drafting	5	768	Operating
110 PLANIMETER	1	Drafting	5	769	Operating
111 DRAWING BARS, parallex	4	Drafting	5	770	Operating
112 MAP MEASURER, Peco pocket model	2	Drafting	5	771	Operating
113 disregard					
114 STEREOSCOPE, pocket model	4	Drafting	5	772	Operating
115 STEREOSCOPE, mirror model	1	Drafting	5	773	Operating
116 DRAFTING TRANSFER SCOPE -disregard					
117 disregard					
118 WEATHER STATION, recording w/cabinet	1	Meteorol.	3	775	Ready to install
118 and RECORDING RAIN GAUGE and WIND SPEED		Meteorol.	3	775	Operating
118 and DIRECTION RECORDER		Meteorol.	3	775	Operating
119 RECORDING RAIN GAUGE		Meteorol.	***		***NOT RECEIVED***
120 RAIN GAUGE w/stand	4	Meteorol.	3	777	Ready to install
121 PENETROMETER (1 of 2)	1	Soils	8	778	Operating

121 PENETROMETER (1 of 2)	1	Wood Prod	9	778	Operating
122 COMPASS (2 of 4)	2	Silvicul.	7	779	Operating
122 COMPASS (2 of 4)	2	Soils	8	779	Operating
123 CLINOMETER (2 of 4)	2	Silvicul.	7	780	Operating
123 CLINOMETER (2 of 4)	2	Soils	8	780	Operating
124 SURVEYING COMPASS	1	Silvicul.	7	781	Operating
125 LIQUID LIMIT APPARATUS		Soils	***		***NOT RECEIVED***
126 BULK DENSITY SAMPLER (1 of 2)	1	Soils	8	783	Operating
126 BULK DENSITY SAMPLER (1 of 2)	1	Sambodja	10	783	Operating
127 TREE MARKING GUN	6	Silvicul.	7	784	Wrong model!
128 SWEDISH TREE LADDER	2	Silvicul.	7	785	Operating
129 TREE CALIPER	2	Silvicul.	7	786	Operating
130 LEVEL, Abney	2	Soils	8	787	Operating
131 DIAMETER TAPE, metric Lufkin	2	Silvicul.	7	788	Operating
132 DIAMER TAPE, metric Lufkin	4	Silvicul.	7	789	Operating
133 WEDGE PRISM	2	Silvicul.	7	790	Operating
134 BARK GAUGE, metric	2	Silvicul.	7	791	Operating
135 RIGHT ANGLE PRISM	1	Silvicul.	7	792	Operating
136 INCREMENT BORER, Suunto	3	Silvicul.	7	793	Operating
137 TAPE MEASURE, metric 30 (1 of 5)	1	Wood Prod	9	794	Operating
137 TAPE MEASURE, metric 30 (1 of 5)	1	Soils	8	794	Operating
137 TAPE MEASURE, metric 30 (3 of 5)	3	Silvicul.	7	794	Operating
138 TAPE MEASURE, metric 100 meter	2	Silvicul.	7	795	Operating
139 HARD HAT	25	Safety	2	796	Operating
140 PLANT PRESS	5	Herbarium	4	797	Operating
141 INSECT NET got 10	10	Pathology	6	798	ok
142 HERBARIUM CABINET	1	Herbarium	4	799	Operating
143 GENUS COVER	200	Herbarium	4	800	ok
144 BACK PACK SPRAYER - SOLO		Silvicul.	***		***NOT RECEIVED***
145 PRUNING SAW	2	Silvicul.	7	801	Operating
146 SHEARS, Pruning	4	Herbarium	4	802	ok
147 BUDDING KNIVES got 7 & 4	8	Biology	4	803	Operating
148 GRAFTING TAPE (F.S.# 79311)	10	Biology	4	804	ok
GRAFTING WAX, 5 lb. (F.S.# 79031)	5	Biology	4	805	ok
149 POLLINATION BAGS	999	Biology	4	806	ok
150 disregard					
151 THERMOMETER, soil	6	Soils	8	807	Operating
152 PUMPS, back pack fire pump	10	Safety	2	808	Operating
153 TIMBER CARRIER (2 of 4)	2	Wood Prod	9	809	Operating
153 TIMBER CARRIER (2 of 4)	2	Silvicul.	7	809	Operating
154 MAGNIFIER, hand lens (2 of 10)	2	Biology	4	810	Operating
154 MAGNIFIER, hand lens (2 of 10)	2	Pathology	6	810	Operating
154 MAGNIFIER, hand lens (2 of 10)	2	Silvicul.	7	810	Operating
154 MAGNIFIER, hand lens (2 of 10)	2	Soils	8	810	Operating
154 MAGNIFIER, hand lens (2 of 10)	2	Wood Prod	9	810	Operating
155 GOGGLES, safety	10	Safety	2	811	Operating
156 disregard					
157 STRETCHER	1	Safety	2	812	Operating
158 SNAKE BITE KIT	10	Safety	2	813	Operating
159 SNAKE BITE FREEZE KIT	5	Safety	2	814	Operating
160 FIRST AID KIT, model 8170	25	Safety	2	815	Operating
160 FIRST AID KIT, model 8163	2	Safety	2	815	Operating
161 BUDDING STRIPS	2	Biology	4	817	ok

FOREST RESEARCH INSTITUTE SAMARINDA
AARP EQUIPMENT AND PRESENT STATUS
[fris1291.wk3]

BALAI PENELITIAN KEHUTANAN Administrative Equipmnt
SAMARINDA

NO.	ITEM NAME, specifications	QTY.	Lab.	Loc.	Ref.#	Notations
39	COMPUTER, IBM PC	2	Admin.	1	700	Operating
40	LAPTOP COMPUTER	2	Admin.	1	701	NOT LOCATED AT FRIS!!!
41	PRINTER	2	Admin.	1	702	Operating
42	CALCULATOR	6	Admin.	1	703	110 Volt adapters/battery ok
43	SLIDE PROJECTOR, 220 VAC	1	Admin.	1	704	Operating
44	OVERHEAD PROJECTOR, 220 VAV	1	Admin.	1	705	Operating
45	PROJECTION SCREEN	1	Admin.	1	706	Operating
46	CAMERA, 35 mm SLR	2	Admin.	1	707	Operating
47	MIMEOGRAPH MACHINE NO! SPIRIT DUPLICATOR	1	Admin.	1	708	Not a Mimeograph machine!
48	MICHROFICHE READER	1	Admin.	1	709	Operating
49	BLUEPRINT MACHINE, 220 VAC	1	Admin.	1	710	Operating
53	GRASS/BRUSH CUTTER	3	Admin.	1	714	Operating

BALAI PENELITIAN KEHUTANAN Meteorology Equipment
SAMARINDA

NO.	ITEM NAME, specifications	QTY.	Lab.	Loc.	Ref.#	Notations
33	HYDROTHERMOGRAPH	2	Meteorol.	3	695	Operating and Calibrated
81	SOLAR METER	1	Meteorol.	3	739	Operating
89	ANEROID BAROMETER	1	Meteorol.	3	748	Operating
96	FIREWEATHER KIT	1	Meteorol.	3	755	Operating
97	FUEL MOISTURE SCALE	1	Meteorol.	3	756	Ready to install
118 and	RECORDING RAIN GAUGE and WIND SPEED		Meteorol.	3	775	Operating
116 and	DIRECTION RECORDER		Meteorol.	3	775	Operating
118	WEATHER STATION, recording w/cabinet	1	Meteorol.	3	775	Ready to install
120	RAIN GAUGE w/stand	4	Meteorol.	3	777	Ready to install

162 disregard					
163 PLASTIC FLAGGING - 2 box each of 6 color	12 Silvicul.	7		818	ok
164 FIELD BOOKS, Write-in-rain	24 Silvicul.	7		819	ok
165 disregard					
166 STORAGE CABINET, for flammable material	1 Wood Prod	9		820	Operating
167 VOICE AMPLIFIER - PORTABLE	Administ.		***		***NOT RECEIVED***
WP01 TABLE SAW 10" - DELTA	1 Wood Prod	9		943	220 V. 15 Amp, 3 Phase *
WP00 BLADE GRINDER FOR PLANER - DELTA	1 Wood Prod	9		944	No manual, Incomplete?
WP00 PLANER 21" - DELTA	1 Wood Prod	9		944	220 V. 26 Amp, 3 Phase *
WP03 JOINTER/PLANER 6" - DELTA	1 Wood Prod	9		945	220 V. 6 Amp, 3 Phase *
WP04 DRILL PRESS - DELTA	1 Wood Prod	9		946	220 V. 3 Amp, 3 Phase *
WP02 BAND SAW 14" - DELTA	1 Wood Prod	9		947	Operating
WP21 RADIAL ARM TABLE SAW 10" - DELTA	1 Wood Prod	9		948	220 V. 14 Amp, 3 Phase *
WP06 JIG/SCROLL TABLE SAW - DELTA	1 Wood Prod	9		949	Operating

BALAI PENELITIAN KEHUTANAN Safety Equipment
SAMARINDA

NO.	ITEM NAME, specifications	QTY.	Lab.	Loc.	Ref.#	Notations
65	EYE WASH STATION	4	Safety	2	725	Operating
66	BURN STATION	4	Safety	2	726	Operating
139	HARD HAT	25	Safety	2	796	Operating
152	PUMPS, back pack fire pump	10	Safety	2	808	Operating
155	GOGGLES, safety	10	Safety	2	811	Operating
157	STRETCHER	1	Safety	2	812	Operating
158	SNAKE BITE KIT	10	Safety	2	813	Operating
159	SNAKE BITE FREEZE KIT	5	Safety	2	814	Operating
160	FIRST AID KIT, model 8163	2	Safety	2	815	Operating
160	FIRST AID KIT, model 8170	25	Safety	2	815	Operating

BALAI PENELITIAN KEHUTANAN Drafting Equipment
SAMARINDA

NO.	ITEM NAME, specifications	QTY.	Lab.	Loc.	Ref.#	Notations
101	DRAFTING MACHINE	1	Drafting	5	760	Operating (1 ruler only)
102	DRAFTING TABLE	1	Drafting	5	761	Operating
104	LIGHT TABLE	1	Drafting	5	763	Operating
109	LETTERING SET	1	Drafting	5	768	Operating
110	PLANIMETER	1	Drafting	5	769	Operating
111	DRAWING BARS, parallex	4	Drafting	5	770	Operating
112	MAP MEASURER, Peco pocket model	2	Drafting	5	771	Operating
114	STEREOSCOPE, pocket model	4	Drafting	5	772	Operating
115	STEREOSCOPE, mirror model	1	Drafting	5	773	Operating

BALAI PENELITIAN KEHUTANAN Biology Lab Equipment
SAMARINDA

NO.	ITEM NAME, specifications	QTY.	Lab.	Loc.	Ref.#	Notations	Ref.#	Nota
2	STERILIZER/AUTOCLAVE	1	Biology	4	671	Operating	671	Operating
3	ANALYTICAL BALANCE (1 of 2)	1	Biology	4	672	Operating - 110 Volt!	672	Operating
4	TOP-LOADING BALANCE (1 of 2)	1	Biology	4	673	Operating	673	Operating
5	WATER BATH (1 of 2)	1	Biology	4	674	Operating	674	Operating
9	ENVIRONMENTAL CHAMBER	1	Biology	4	678	Operating	678	Operating
12	SEED GERMINATOR	1	Biology	4	681	Operating	681	Operating
15	INCUBATOR, refrigerated	1	Biology	4	683	Operating	683	Operating
18	MICROSCOPE, Stereo zoom (1 Of 2)	1	Biology	4	686	Operating	686	Operating
21	OVEN, Mechanical convection (1 of 4)	1	Biology	4	688	Operating	688	Operating
24	REFRIGERATOR/FREEZER (1 of 3)	1	Biology	4	690	Operating	690	Operating
55	pH METER, portable (1 of 2)	1	Biology	4	716	Operating	716	Operating
58	STIRRER, Magnetic (1 of 2)	1	Biology	4	719	Operating	719	Operating
59	BLENDER (1 of 2)	1	Biology	4	720	Operating	720	Operating
62	HOT PLATE, Stirring (1 of 2)	1	Biology	4	722	Operating	722	Operating
61	HOT PLATE (1 of 2)	1	Biology	4	723	Operating	723	Operating
67	BALANCE, Triple Beam (1 of 4)	1	Biology	4	727	Operating	727	Operating
72	MICROTOME	1	Biology	4	731	Operating	731	Operating
73	MIXER, Vortex stirrer (1 of 2)	1	Biology	4	732	Operating - 110 Volt!	732	Operating
84	TRANSFER HOOD, Laminar flow	1	Biology	4	742	Operating	742	Operating
91	THERMOMETER, Minimum-maximum (2 of 6)	2	Biology	4	750	Operating	750	Operating
103	FUME HOOD, Fiberglass 47 (1 of 3)	1	Biology	4	763	OK, needs outside vent	763	OK, needs
147	BUDDING KNIVES got 7 & 4	8	Biology	4	803	Operating	803	Operating
148	GRAFTING TAPE (F.S.# 79311)	10	Biology	4	804	ok	804	ok
	GRAFTING WAX, 5 lb. (F.S.# 79031)	5	Biology	4	805	ok	805	ok
149	POLLINATION BAGS	999	Biology	4	806	ok	806	ok
154	MAGNIFIER, hand lens (2 of 10)	2	Biology	4	810	Operating	810	Operating
161	BUDDING STRIPS	2	Biology	4	817	ok	817	ok
140	PLANT PRESS	5	Herbarium	4.1	797	Operating	797	Operating
142	HERBARIUM CABINET	1	Herbarium	4.1	799	Operating	799	Operating
143	GENUS COVER	200	Herbarium	4.1	800	ok	800	ok
146	SHEARS, Pruning	4	Herbarium	4.1	802	ok	802	ok

BALAI PENELITIAN KEHUTANAN Soils Equipment
SAMARINDA

NO.	ITEM NAME, specifications	QTY.	Lab.	Loc.	Ref.#	Notations
55	pH METER, portable	2 soils	-1	716		
3	ANALYTICAL BALANCE (1 of 2)	2 Soils	8		672	Operating
4	TOP-LOADING BALANCE (1 of 2)	2 Soils	8		673	Operating
6	CENTRIFUGE	1 Soils	8		675	Operating
7	SPECTROPHOTOMETER	1 Soils	8		676	Operating
8	CONDUCTIVITY/SALINITY METER (1 of 2)	1 Soils	8		677	Operating
10	FLAME PHOTOMETER	1 Soils	8		679	Clinical medical model
11	FREEZER	1 Soils	8		680	Operating
14	WILEY CUTTING MILL	1 Soils	8		681	Operating
16	KJELDAHL NITROGEN DIGESTOR	1 Soils	8		682	Insufficient electricity
17	NITROGEN DISTILATION UNIT	1 Soils	8		684	Operating
21	OVEN, Mechanical convection (1 of 4)	1 Soils	8		688	Operating
22	pH METER, Digital	1 Soils	8		689	Operating
24	REFRIGERATOR/FREEZER (1 of 3)	1 Soils	8		690	Operating
26	SHAKER, Reciprocal	1 Soils	8		691	Operating
23	SIEVING MACHINE, Laboratory type	1 Soils	8		692	Without seives!
34	SOIL TEST KIT	1 Soils	8		696	Operating
51	COMPRESSOR	1 Soils	8		712	Operating
54	VACUUM PUMP	1 Soils	8		715	Operating - Broken case
55	pH METER, portable (1 of 2)	1 Soils	8		716	Operating
56	DEIONIZER	1 Soils	8		717	Operating
58	STIRRER, Magnetic (1 of 2)	1 Soils	8		719	Operating
59	BLENDER (1 of 2)	1 Soils	8		720	Operating
60	DEHUMIDIFIER	1 Soils	8		721	Operating
62	HOT PLATE, Stirring (1 of 2)	1 Soils	8		722	Operating
61	HOT PLATE (1 of 2)	1 Soils	8		723	Operating
64	VIBRATING SPATULA	1 Soils	8		724	Operating
67	BALANCE, Triple Beam (1 of 4)	1 Soils	8		727	Operating
68	BALANCE, Solution (1 of 2)	1 Soils	8		728	Operating
69	BOMB CALORIMETER	1 Soils	8		729	Not assembled
71	FURNACE, Muffle	1 Soils	8		730	Insufficient electricity
73	MIXER, Vortex stirrer (1 of 2)	1 Soils	8		732	Operating
74	TIME SWITCH	2 Soils	8		733	Operating
75	TURBIDITY METER, Portable	1 Soils	8		734	Operating
76	TRANSFORMERS, Step down (Set)	2 Soils	8		735	Operating
77	THERMOGRAPH	Soils	8		736	Missing probe!
83	PHOTOMETER MINI SPEC 20	1 Soils	8		741	Ordered light meter
85	WATER LEVEL INDICATOR (1 of 4)	1 Soils	8		743	Operating
85	WATER LEVEL INDICATOR (1 of 4)	1 Soils	8		743	Operating
85	WATER LEVEL INDICATOR (1 of 4)	1 Soils	8		743	Operating
85	WATER LEVEL INDICATOR (1 of 4)	1 Soils	8		743	Operating
86	WATER FLOW METER	1 Soils	8		744	Operating
87	TENSIOMETER, Soil test	20 Soils	8		745	Operating
87	TENSIOMETER, Portable Quick Draw	1 Soils	8		746	Operating
88	SOIL PRESSURE MEMBRANE APPARATUS	1 Soils	8		747	Incomplete
91	THERMOMETER, Minimum-maximum	6 Soils	8		750	Operating

BALAI PENELITIAN KEHUTANAN Wood Products Lab Equipment
SAMARINDA

NO.	ITEM NAME, specifications	QTY.	Lab.	Loc.	Ref.#	Notations
21	OVEN, Mechanical convection (1 of 4)	1	Wood Prod	9	688	Operating
36	CALIPER, Dial type	4	Wood Prod	9	697	Operating
37	CALIPER, Vernier type	4	Wood Prod	9	698	Operating
38	CALIPER, MICROMETER	4	Wood Prod	9	699	Operating
67	BALANCE, Triple Beam (1 of 4)	1	Wood Prod	9	727	Operating
68	BALANCE, Solution (1 of 2)	1	Wood Prod	9	728	Operating
121	PENETROMETER (1 of 2)	1	Wood Prod	9	778	Operating
137	TAPE MEASURE, metric 30 (1 of 5)	1	Wood Prod	9	794	Operating
153	TIMBER CARRIER (2 of 4)	2	Wood Prod	9	809	Operating
154	MAGNIFIER, hand lens (2 of 10)	2	Wood Prod	9	810	Operating
166	STORAGE CABINET, for flammable material	1	Wood Prod	9	820	Operating
WP01	TABLE SAW 10" - DELTA	1	Wood Prod	9	943	220 V. 15 Amp, 3 Phase
WP00	BLADE GRINDER FOR PLANER - DELTA	1	Wood Prod	9	944	No manual, Incomplete?
WP00	PLANER 21" - DELTA	1	Wood Prod	9	944	220 V. 26 Amp, 3 Phase
WP03	JOINTER/PLANER 8" - DELTA	1	Wood Prod	9	945	220 V. 6 Amp, 3 Phase ‡
WP04	DRILL PRESS - DELTA	1	Wood Prod	9	946	220 V. 3 Amp, 3 Phase ‡
WP02	BAND SAW 14" - DELTA	1	Wood Prod	9	947	Operating
WP21	RADIAL ARM TABLE SAW 10" - DELTA	1	Wood Prod	9	948	220 V. 14 Amp, 3 Phase
WP06	JIG/SCROLL TABLE SAW - DELTA	1	Wood Prod	9	949	Operating

‡ Total 220 Volt, 3 Phase requirement = 63 Amps = 13.8 Kwatts

Minimum Service to Wood Products Building For Present Use
Should = 100 Amps = 22 KWatts

Future Needs May = 250 Amps = 55 KWatts

BALAI PENELITIAN KEHUTANAN Equipment Specified for Wanareset 1
SAMARINDA

NO.	ITEM NAME, specifications	QTY.	Lab.	Loc.	Ref.#	Notations
5	WATER BATH (1 of 2)	1	Sambodja	10	674	Operating
8	CONDUCTIVITY/SALINITY METER (1 of 2)	1	Sambodja	10	677	Operating
19	MICROSCOPE, Research (1 of 2)	1	Sambodja	10	687	Operating - 110 Volts
26	SHAKER, Reciprocal	1	Sambodja	10	691	Operating
126	BULK DENSITY SAMPLER (1 of 2)	1	Sambodja	10	783	Operating

92 DISOLVED OXEGEN METER	1 Soils	8	751	Operating
93 B.O.D. METER	1 Soils	8	752	Operating
95 STILL, Barnstead glass still	1 Soils	8	754	Operating
103 FUME HOOD, Fiberglass 47 (1 of 3)	1 Soils	8	763	Operating
105 SOIL COLOR CHART, Munsell	2 Soils	8	764	Operating
106 SOIL SAMPLERS, tube type	2 Soils	8	765	Operating
107 SOIL SAMPLERS, bucket type	2 Soils	8	766	Operating
108 SOIL SAMPLERS, auger type	2 Soils	8	767	Operating
121 PENETROMETER (1 of 2)	1 Soils	8	778	Operating
122 COMPASS (2 of 4)	2 Soils	8	779	Operating
123 CLINOMETER (2 of 4)	2 Soils	8	780	Operating
126 BULK DENSITY SAMPLER (1 of 2)	1 Soils	8	783	Operating
130 LEVEL, Abney	2 Soils	8	787	Operating
137 TAPE MEASURE, metric 30 (1 of 5)	1 Soils	8	794	Operating
151 THERMOMETER, soil	6 Soils	8	807	Operating
154 MAGNIFIER, hand lens (2 of 10)	2 Soils	8	810	Operating
THERMOMETER, soil	6	1 807		
MAGNIFIER, hand lens got 10	6	1 810		

Balai Penelitian Kehutanan Samarinda
Jl. Pandan Wangi, Semboja
Chemicals list, 1991

Item No.	Qty	Pack	Item, specs.	Fisher Cat. No.	Unit Price	US $ Total
1	2	case	ACETIC ACID, glacial, 6x1 L case, safe cot	A-38S-500	78.80	157.60
2	1	case	ACETONE, ACS, 6X1 l case	A18-1	57.70	57.70
3	1	each	ALUMINON, ACS, crystal, 25 g	A-546	56.30	56.30
4	1	each	ALUMINUM METAL, ACS, wire, 500 g	A557-500	62.70	62.70
5	1	box	AMINO NAPTHOL SULFONIC ACID, 12 pack/box	A974-500	35.15	35.15
6	1	each	AMMONIUM ACETATE, ACS, crystal, 10 kg	A637-10	221.80	221.80
7	1	each	AMMONIUM CHLORIDE, ACS, 500 g	A661-500	18.50	18.50
8	1	each	AMMONIUM FLUORIDE, ACS, cystal, 500 g	A665-500	83.20	83.20
9	1	case	AMMONIUM HYDROXIDE, ACS, 6X2.5 l	A669S-212	93.10	93.10
10	1	each	AMMONIUM MOLYBDATE, ACS, crystal, 500 g	A674-500	115.75	115.75
11	1	each	AMMONIUM NITRATE, ACS, crystal, 500 g	A676-500	18.35	18.35
12	1	each	AMMONIUM PHOSPHATE, diabasic, 6X500 g	A-686-500	157.70	157.70
13	1	each	AMMONIUM PHOSPHATE, monobasic, 6X500 g	A-684-500	131.85	131.85
14	1	each	AMMONIUM SULFATE, primary standard, 500 g	A393-500	17.70	17.70
15	1	each	AMMONIUM VANADATE, meta, 500 g	A-7141	55.70	55.70
16	1	each	ANTIMONY POTASSIUM TARTRATE, certified, 50	A-865-500	61.50	61.50
17	1	each	ASCORBIC ACID, ACS,crystal, 100 g	A-61-100	25.30	25.30
18	1	each	BARIUM CHLORIDE, dihydrate, ACS, crytal, 5	B- 34-500	28.50	28.50
19	1	each	BARIUM DIPHENOLAMINE SUFONATE, certified,	B38- 25	198.00	198.00
20	1	each	BORIC ACID, ACS, crystal, 500 g	A73-500	22.90	22.90
21	1	each	BROMCRESOL GREEN, ACS, 5 g	B383-5	56.95	56.95
22	1	pack	BUFFER PAK, pH 4, 7, 10, 6/pack	SB105	154.75	154.75
23			omit			
24			omit			
25	1	each	CALCIUM CARBONATE, ACS, powder, 500 g	C64-500	65.35	65.35
26	1	each	CALCIUM CHLORIDE, ACS, dihydrate, 500 g	C79-500	21.20	21.20
27	1	each	CITRIC ACID, ACS, anhydrous, 500 g	A-940-500	19.55	19.55
28	1	each	CUPRIC SULFATE, ACS, crystal, 500 g	C493-500	29.25	29.25
29	4	each	METHYL ALCOHOL, ACS, 4 l	A412SK-4	30.45	121.80
30	1	each	EDTA ACID, ACS, 500 g	E478-500	40.50	40.50
31	1	case	FERROUS AMMONIUM SULFATE, ACS, crystal, 6X	I-77-500	248.55	248.55
32	1	each	FERROUS SULFATE, ACS, crystal, 6X500 g	I-146-500	29.60	29.60
33	2	case	HYDROCHLORIC ACID, ACS, 6X2.5 l safe cote	A-144S-212	99.90	199.80
34	2	case	HYDROGEN PEROXIDE, ACS, 50% stabilized, 6X	H341-500	126.05	252.10
35	2	each	LANTHANUM CHLORIDE, certified, 50 g	L-9-50	32.55	65.10
36	1	each	MAGNESIUM OXIDE, ACS, powder, 500 g	M51-100	294.40	294.40
37	1	each	MAGNESIUM SULFATE, ACS, crystal, 500 g	M63-500	28.40	28.40
38	1	each	METHYL RED, ACS, sodium salt, 10 g	M301-10	39.00	39.00
39	1	each	N-(1 NAPTHYL) ETHYLENE DIAMINE HCl, 25 G	1175025	49.50	49.50
40	2	case	NITRIC ACID, ACS, 6X2.5 l safe cote	A-200S-212	127.25	254.50
41	1	each	NITROPHYNOL (para), crystal, 500 g	1029560	25.05	25.05
42	1	each	OXALIC ACID, ACS, crystal, 500 g	A-219-500	39.40	39.40
43			omit			
44	1	each	PHENANTHROLINE, (1,10) ACS, 10 g	P-70-5	40.50	40.50
45	1	each	PHENOL, ACS, crystal, 500 g	A-92-500	46.15	46.15
46	1	each	PHYNOLTHALEIN, ACS, 100 g	P79-100	21.15	21.15
47	1	each	PHENYLANTHRANILIC ACID, (N), 10 g	1139393	16.90	16.90
48	1	each	PHOSPHORIC ACID, ORTHO, ACS, 85% 6X1 l/cas	A-242-1	122.10	122.10
49	2	case	POTASSIUM CHLORIDE, ACS, crystal, 6X500 g/	P217-500	77.50	155.00
50	1	each	POTASSIUM DICHROMATE, ACS, 500 g	P-188-500	57.35	57.35

51	1 case	POTASSSIUM HYDROXIDE, ACS, pellet, 6X500 g	P-250-500	84.20	84.20
52	1 each	POTASSIUM NITRATE, certified, crystal, 500	P263-500	29.70	29.70
53	1 each	POTASSIUM PERMANGANATE, ACS, crystal, 500	P-279-500	27.55	27.55
54	1 each	POTASSIUM PHOSPHATE, primary std., 500 g	P-382-500	31.10	31.10
55	1 each	POTASSIUM SULFATE, ACS, crystal, 500 g	P304-500	27.50	27.50
56	1 each	PYROGALLOL, ACS, crystal, 100 g	A-263-100	62.10	62.10
57	1 each	SALICYLDEHYDE, reagent grade, 500 ml	A281-500	159.75	159.75
58	1 each	SAND, seasand, washed, 500 g	S-25-500	10.10	10.10
59	2 pack	SELENIUM CATALYST, kjeltabs, 1000/pack	13-159B	63.00	126.00
60		omit			
61	1 each	SILVER NITRATE, ACS, crystal, 25 g	S181-25	43.75	43.75
62	1 each	SODIUM (di) EDTA, ACS, crystal, 500 g	S-311-500	57.85	57.85
63	1 each	SODIUM BICARBONATE, USP, 3 kg	S631-3	26.65	26.65
64	1 each	SODIUM CARBONATE, ACS, anhydrous, 500 g	S-263-500	20.00	20.00
65	1 each	SODIUM CHLORIDE, ACS, 500 g	S271-500	10.70	10.70
66	1 each	SODIUM CITRATE, certified, granular, 500 g	S279-500	17.50	17.50
67	1 each	SODIUM COBALTINITRATE, ACS, 100 g	S-280-100	37.35	37.35
68	1 each	SODIUM DITHIONATE, purified, 100 g	S290	54.10	54.10
69	2 case	SODIUM HYDROXIDE, ACS, PELLET, 6X500 g	S318-500	71.85	143.70
70	1 case	SODIUM HYPOCHLORITE, solution, 6X1 l	SS-290-1	42.90	42.90
71	1 each	SODIUM LAURYL SULFATE, powder, 500 g	S529-500	38.80	38.80
72	1 case	SODIUM METAPHOSPHATE, purified, powder, 6X	s-333-500	55.70	55.70
73	1 each	SODIUM NITRATE, ACS, crystal 500 g	S-343-500	36.55	36.55
74	1 each	SODIUM NITRITE, ACS, crystal 500 g	S-347-500	36.50	36.50
75	1 each	SODIUM NITROPRUSSIDE, ACS, crystal, 100 g	S-350-100	31.30	31.30
76	1 each	SODIUM OXALATE, ACS, 100 g	S-487-500	54.40	54.40
77	1 case	SODIUM PHOSPHATE, dibasic, anhydrous, ACS,	s-374-500	106.95	106.95
78	1 case	SODIUM PHOSPHATE, monobasic, anhydrous, ACS	-369-500	166.95	166.95
79	1 each	SODIUM SALICYLATE, certified, powder, 500	S395-500	42.85	42.85
80	1 each	SODIUM SULFATE, ACS, anhydrous, 500 g	S421-500	14.05	14.05
81	1 each	SODIUM SULFITE, ACS, anhydrous 500 g	S447-500	12.40	12.40
82	1 each	SODIUM TARTRATE, ACS, crystal, 100 g	S435-100	19.55	19.55
83	1 each	STANNOUS CHLORIDE, ACS, crystal, 500 g	T-142-500	86.25	86.25
84	1 each	STRONTIUM CHLORIDE, ACS, crystal, 500 g	S541-500	103.00	103.00
85	1 each	SUCROSE, ACS, crystal, 500 g	S5-500	17.85	17.85
86	1 each	SULFANILAMIDE, certified, 100 g	O-4525-100	23.85	23.85
87	1 each	SULFURIC ACID, 1 N solution, 6X1 l	SA212-1	48.05	48.05
88	2 case	SULFURIC ACID, ACS, 6X2.5 l safe cote	A300S-212	128.60	257.20
89	1 each	ZINC OXIDE, ACS, Powder, 500 g	Z52-500	20.95	20.95
90	1 each	ALUMINUM, Ref. Std. for AAS, 500 ml	SA-442-500	29.15	29.15
91	1 each	CALCIUM, Ref. Std. for AAS, 500 ml	SC-191-500	19.65	19.65
92	1 each	CHROMIUM, Ref. Std. for AAS, 500 ml	SC-192-500	19.65	19.65
93	1 each	COBOLT, , Ref. Std. for AAS, 500 ml	SC-193-500	19.65	19.65
94	1 each	COPPER, Ref. Std. for AAS, 500 ml	SC-194-500	19.65	19.65
95	1 each	IRON, Ref. Std. for AAS, 500 ml	SI-124-500	19.65	19.65
96	1 each	MAGNESIUM, Ref. Std. for AAS, 500 ml	SM-51-500	19.65	19.65
97	1 each	MANGANESE, Ref. Std. for AAS, 500 ml	SM-81-500	19.65	19.65
98	1 each	POTASSIUM, Ref. Std. for AAS, 500 ml	SP-351-500	19.65	19.65
99	1 each	SODIUM, Ref. Std. for AAS, 500 ml	SS-139-500	19.65	19.65
100	1 each	ZINC, Ref. Std. for AAS, 500 ml	SZ-13-500	19.65	19.65
			TOTAL	6524.50	

Balai Penelitian Kehutanan Sanarinda
Jl. Pandan Wangi, Sembaja
Supplies list, 1991

Item No.	Qty	Pack	Item, specs.	Fisher Cat. No.	Unit Price	US$ Total
1	1	roll	Aluminum foil,76mmx96m	01-213	12.00	12.00
2	1	set	Balance calibrating weight set	02-231	350.00	350.00
3	2	box	Weigh.dish, box 500, size 67mm	02-202B	42.50	85.00
4	1	case	Beaker, 50 ml, 48 pc/case	02-540G	68.16	68.16
5	1	case	Beaker, 100 ml, 48 pc/case	02-540H	72.96	72.96
6	1	case	Beaker, 250 ml, 48 pc/case	02-540K	68.16	68.16
7	1	case	Beaker, 600 ml, 36 pc/case	02-540M	77.04	77.04
8	1	case	Beaker, 1000 ml, 24 pc/case	02-540P	97.68	97.68
9	1	case	Beaker,2000 ml, 8 pc/case	02-540R	64.56	64.56
10	4	case	Bottle, Reagent 250 ml, 6/case	03-439-51B	26.95	107.80
11	2	case	Bottles, Nalgene, 1 l.24/case	02-925F	66.00	132.00
12	2	case	Bottle, Nalgene, 10 l. 6/case	02-963A	258.84	517.68
13	4	packs	Bottle, Dropping, 60 ml 6/pack	03-004	6.00	24.00
14	1	case	Bottle, Glass Drp.,60 ml 36/ca	02-983B	43.00	43.00
15	1	pack	Bottle, Wash 24/case	03-409-22C	58.00	58.00
16	1	pack	Beaker Brush, 12/pack	03-555	70.00	70.00
17	1	pack	Flask Brush, 12/pack	03-570B	60.00	60.00
18	1	pack	Test Tube Brush, 12/pack	03-578	29.00	29.00
19	1	case	Buret, Nalgene 50 ml, 4 case	03-705C	131.32	131.32
20	1	case	Buret, Nalgene 100 ml, 4 case	03-705D	142.48	142.48
21	4	each	Buret, 3-way filling, 50 ml	03-745B	51.00	204.00
22	2	pack	Buret, Dispensing Auto-100 ml	03-844B	190.00	380.00
23	2	each	Buret Stand	14-688	60.00	120.00
24	6	each	Burner, LP gas	03-962P	30.00	180.00
25	6	each	Burner, Alcohol	04-245AA	3.71	22.26
26	1	pack	Burner Wicks 12/pack	04-250	2.50	2.50
27	1	each	Centrifuge Rotor 4 place	05-103B	242.00	242.00
28	2	pack	Centrifuge Tube Shields 100ml	05-162	66.40	132.80
29	2	pack	Centrifuge Trunnion Rings 2/pa	05-225	42.20	84.40
30	2	pack	Centrifuge tubes 100 ml 10/pac	05-562-10C	25.30	50.60
31	2	pack	Centrifuge tubes 16x101 10/pac	05-562-10A	9.50	19.00
32	6	each	Clamps, Utility	05-769	18.00	108.00
33	1	pack	Clamps, Hose 10/pack	05-870A	17.50	17.50
34	1	pack	Cork Borer Set	07-850-10	113.00	113.00
35	1	each	Cork Borer Sharpener	07-865	33.00	33.00
36	1	case	Crucibles, Porc.30 ml 36/case	07-965E	115.50	115.50
37	36	each	Crucible Covers	07-970F	3.98	143.28
38	4	each	Filtering crucibles	08-236-1C	12.91	51.64
39	6	each	Measuring Cylinder PP 10 ml	08-572-6A	2.85	17.10
40	6	each	Measuring Cylinder PP 25 ml	08-572-6B	3.35	20.10
41	6	each	Measuring Cylinder PP 50 ml	08-572-6C	4.25	25.50
42	6	each	Measuring Cylinder PP 100 ml	08-572-6D	5.15	30.90
43	6	each	Measuring Cylinder PP 250 ml	08-572-6E	6.85	41.10
44	6	each	Measuring Cylinder PP 500 ml	08-572-6F	9.50	57.00
45	4	case	Measuring Cyl. PP 1000 ml 6/ca	08-572-6G	71.00	284.00
46	1	each	Desiccant, Indicator 8 mesh,5l	07-578-3B	43.50	43.50
47	1	case	Desiccant, 8 mesh, 4/case	07-5774B	59.50	59.50
48	4	each	Dispensers, Repipet III, 20 ml	13-687-102	73.25	293.00
49	2	each	Dissecting Set	08-855	22.00	44.00
50	5	case	Filter Paper, What. 54, 9cm. 5	09-868A	51.50	257.50

51	10 case	Filter Paper, What. 2, 9cm. 5/	09-810D	15.00	150.00
52	5 case	Filter Paper, What. 5, 9cm. 5/	09-830A	23.25	116.25
53	5 case	Filter Paper, What. 42, 9cm.5/	09-855B	51.50	257.50
54	1 case	Hand Vacuum Pump, 4/case	01-070	187.32	187.32
55	1 pack	Flask, Erlenmeyer 25 ml 12/pac	10-040B	26.80	26.80
56	1 case	Flask, Erlenmeyer 50 ml 48/cas	10-040C	87.84	87.84
57	1 case	Flask, Erlenmeyer 125 ml 48/ca	10-040D	84.96	84.96
58	1 case	Flask, Erlenmeyer 250 ml 48/ca	10-040F	87.84	87.84
59	1 case	Flask, Erlenmeyer 500 ml 36/ca	10-040H	82.80	82.80
60	1 pack	Flask, Erlenmeyer 1000 ml 6/pa	10-040K	27.59	27.59
61	2 case	Flask, Nalgene Filter 500 ml 1	10-182-50A	78.00	156.00
62	1 case	Flask, Vol. Kimax 50 ml 12/cas	10-199C	84.72	84.72
63	1 case	Flask, Vol. Kimax 100 ml 12/ca	10-199D	97.20	97.20
64	1 case	Flask, Vol. Kimax 200 ml 12/ca	10-199E	111.48	111.48
65	1 case	Flask, Vol. Kimax 500 ml 12/ca	10-199G	145.92	145.92
66	1 case	Flask, Vol. Kimax1000 ml 6/cas	10-199H	93.54	93.54
67	1 case	Flask, Vol. Kimax 2000 ml 4/ca	10-199J	96.28	96.28
68	1 case	Funnels, Filter, Poly 36/case	10-347D	41.04	41.04
69	2 case	Funnel,Buchner, Poly 4/case	10-362D	30.08	60.16
70	1 pack	Funnel, Powder, Poly 12/pack	10-348B	17.52	17.52
71	1 pack	Filter Adapter Set 6/pack	10-184	17.35	17.35
72	1	Gas Regulators (page 564)			0.00
73	2 each	Glass Tubing Cutter	11-345	10.00	20.00
74	1 bundle	Glass Tubing 25# Bundle Assort	11-366-10	167.50	167.50
75	2 pack	Gloves, Disposable Med. 100/pa	11-394-31B	16.25	32.50
76	2 each	Lubriseal Glass Lub 75 g tube	14-635M	10.35	20.70
77	2 each	Hydrometer, Soil	14-331-5C	22.50	45.00
78	4 each	Lable Tape 13mmx13m White	11-880A	2.50	10.00
79	4 each	Lable Tape 13mmx13m Red	11-880E	2.50	10.00
80	4 each	Lable Tape 13mmx13m Blue	11-880G	2.50	10.00
81	4 each	Lable Tape 13mmx13m Green	11-880C	2.50	10.00
82	4 each	Lable Tape 13mmx13m Yellow	11-880B	2.50	10.00
83	1 case	Tape Dispenser, for 13mm tape	11-880-26	9.90	9.90
84	4 each	Magnifier, Tripod 10 X	12-055	10.25	41.00
85	2 gross	Microscope Slides 75x25mm	12-518-100B	10.00	20.00
86	1 pack	Microscope cover slips 1000 pa	12-547	20.50	20.50
87	2 each	Mortar and Pestle, AlumOx 75mm	12-948D	54.62	109.24
88	2 each	Mortar, Porcelain 115mm dia	12-961B	12.43	24.86
89	2 each	Pestal, Porcelain	12-961-5B	9.05	18.10
90	1 pack	Marker Pen 12/pack fine black	13-381	13.50	13.50
91	1 pack	HiTemp Green Marker	13-382-16	11.00	11.00
92	1 case	pHydron Paper 3-5.5 & 6-8	14-650-10J	40.00	40.00
93	1 case	pHydron Paper 1-12	14-850-11B	40.00	40.00
94	4 each	Pipets, vol. 1 ml	13-650B	3.95	15.80
95	4 each	Pipets, vol. 2 ml	13-650C	3.95	15.80
96	4 each	Pipets, vol. 5 ml	13-650F	4.25	17.00
97	4 each	Pipets, vol. 10 ml	13-650L	4.73	18.92
98	4 each	Pipets, vol. 20 ml	13-650N	6.94	27.76
99	4 each	Pipets, vol. 25 ml	13-650P	7.30	29.20
100	4 each	Pipets, vol. 50 ml	13-650S	9.74	38.96
101	4 each	Pipets, vol.100 ml	13-650U	13.75	55.00
102	4 each	Pipets, Mohr 1 ml	13-665G	3.80	15.20
103	4 each	Pipets, Mohr 10 ml	13-665H	4.93	19.72
104	4 each	Pipets, Mohr 25 ml	13-665N	7.70	30.80
105	4 each	Pipet Filler, red	13-681-51	18.50	74.00
106	2 pack	Dropper, 1 ml calibrated, 12/p	13-703A	6.50	13.00

107	1	Seives page 979			0.00
108	6 each	Spatula, Wood handle	14-365B	6.00	36.00
109	1 pack	Spatula, Spoonula 6/pack	14-375-10	25.00	25.00
110	1 pack	Stoppers, Rubber #0	14-141A	13.50	13.50
111	2 pack	Stoppers, Rubber #1	14-141B	13.50	27.00
112	1 case	Stoppers, Rubber #5	14-141F	65.50	65.50
113	1 case	Stoppers, Rubber #6	14-141G	65.50	65.50
114	1 case	Stoppers, Rubber #7	14-141J	65.50	65.50
115	2 pack	Stoppers, Rubber #9	14-141L	14.50	29.00
116	6 each	Tripod Base Stand, 50cm	14-675B	35.00	210.00
117	4 each	Funnel Support Arm	14-740	15.50	62.00
118	4 each	Tripods 23cmx15cm	15-300B	17.00	68.00
119	1 pac	Wire Guaze Heating Screen 10/p	15-590B	32.50	32.50
120	4 each	Thermometer -20-150C	14-986C	4.60	18.40
121	3 each	Timer, 60 min interval	06-662-10	22.00	66.00
122	2 each	Timer/stopwatch	14-649-15	25.00	50.00
123	4 each	Tongs, Beaker	02-620	20.50	82.00
124	6 each	Tongs, Lab TFE Coated	15-202-5	8.90	53.40
125	2 each	Tongs, Long Handle, Jumbo	15-207	25.00	50.00
126	1 pack	Triangle,Crucible Heating,51mm	15-260B	36.00	36.00
127	1 pack	Test Tube Kimax 25x150mm 72/pa	14-956K	55.43	55.43
128	1 pack	Test Tube Kimax 20x150mm 72/pa	14-956G	34.31	34.31
129	1 each	Test Tube Rack 20 mm Slant Tub	14-796-5	15.50	15.50
130	1 each	Test Tube Rack 25mm tubes	14-809-28	9.50	9.50
131	1	Test Tube Rack Centro Tubes	Pg 1049		0.00
132	1 pack	Tubing- Vac. 6mm 4m/pack	14-175C	30.00	30.00
133	1 pack	Tubing- Vac. 10mm 4m/pack	14-175E	38.00	38.00
134	1 pack	Tubing Clamp 10/pack	14-198-5B	8.00	8.00
135	1 kit	Tubing, Vinyl Kit 4.8mmID 15m/	14-174-1A	19.50	19.50
136	1 kit	Tubing, Vinyl Kit 6.4mmID 15m/	14-174-1C	24.00	24.00
137	1 kit	Tubing, Vinyl Kit 9.5mmID 15m/	14-174-1G	34.50	34.50
138	1 kit	Tubing, Vinyl Kit 13mmID 15m/k	14-174-1H	39.50	39.50
139	1 case	Vial 20ml glass vial w/cap 500	03-337-4	81.50	81.50
140	1 each	Methods Manual/Water	15-413-3	106.00	106.00
141	1 case	Kimwipes 11x22cm 60 pack/case	06-666A	99.00	99.00
142	1 each	Parafilm Wrap 10mmx76m roll	13-374-12	24.00	24.00
143	1 case	Slide Staining Jar Poly 12/cas	08-815-10	31.50	31.50
144	1 case	Innoculating Needles w/handle	13-086	30.00	30.00
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