

topography has no water level difference, a natural drainage will be difficult discharge and also it is not known which agency will be responsible for this project implementation. If RID will be responsible for the project implementation, pollution problem may occur in the lower reaches of the river even in case of pump drainage with a sedimentation basin. As a result, this recommendation will bring much difficulty.

2. Recommendation by JICA Study Team

In April, 1992, the Office of the National Environmental Board (ONEB) presided by vice-prime minister became the National Environmental Board (NEB) which is now presided by the prime minister, and the Ministry of Science, Technology and Environment (MOSTE) which manages environmental matters provided the governmental ordinance for national environmental conservation (environmental impact mitigative measures). According to the ordinance, the NEB will regulate the environmental conservation in the specified area. The following matters will be recommended by JICA study Team.

- 1) RID should apply the ordinance to the upstream area of the diversion dam for water conservation as one of the water rights. In addition, considering the present water quality controlling system, a suspension of a actual development for the time being should be included in the specified conditions.
- 2) Livestock discharge should be more strictly controlled and the right to order its improvement is to be made by the Ministry of Agriculture and Cooperatives (MOAC) if some problem exist. The present oxidization ponds for the discharge will be, therefore, necessary for the new livestock raisers.
- 3) RID should have a right to carry out water quality analyses in the laboratory for the enterprise discharges in the specified area, such as livestock, fisheries and factories drainages, and should exercise the right including improvement of order, shutdown of operation, etc. if problem exists.

CHAPTER 4. ENVIRONMENTAL IMPACT MONITORING PROGRAM AND ITS EXECUTION

Even if NEB wants to decide such specific area, the capability of the Water Test Institute which belongs to the Pollution Control Office (PCO) of the MOSTE, would not be sufficient to check the present water quality. Also, the Ministry of Industry (MOI) lacks the capability to conduct tests on the waste water from the factories.

There is no problem in following the recommendations stated in EIA Report as well as the existing ordinances in Thailand in respect to the monitoring system. However, the water quality analyses organizations must be rearranged and strengthened in terms of manpower and materials.

JICA Study Team, therefore, recommended that the water quality analysis facilities in the Research and Laboratory Department of RID must be provided with the instrument and equipment shown on Table 7.

CHAPTER 5. ENVIRONMENTAL CONSIDERATION RELATING TO IMPLEMENTATION

Emphasis on environmental consideration was put sufficiently by the JICA Study Team in conformity with Thai domestic laws and regulations as well as the recommendations described in the EIA report. Toward this end, the Team will add a new recommendation based on the results of their water quality analyses and field works mentioned below:

- The excavated soil will be reclaimed upto 3m in depth upstream and downstream of existing river course, which will be left after the diversion canal construction, so as to prevent pollution of the river from stagnation.

The reasons are explained as follows;

If the river water depth becomes so shallow as 3 m, the solar beams will easily reach the river bottom, the water temperature be raised up and oxygen be amply supplied from the water surface dissolving into water by wave motion due to wind or boating.

As a result, it will be an environment suitable to grow aquatic plants such as green algae, which release oxygen by photosynthesis into the water. Under such circumstances, the river course will not be polluted but rather eventually purified.

Table 7. Instrument list for Laboratory of RID

Name of Instrument	Cost/Unit (Baht)	Maker	Reason
1. Personal Micro Computer, Printer & UPS. (2 sets) CPU	83,000	Intel 80486 DX-50 Micro-processor	For Analyzed and Collected Data of Water Sample
Printer (Thai & English) Ups.	23,000	Epson Model 1Q-1170	
	55,000	Quasar Micro Ups 7019 1 KVA	
2. Type writer 1 unit (Thai & English)	25,000	Olympia standard 200 BT.	For Printed Report
3. Kjeldahl Distillation 1 unit	120,000	Gerhardt macro 750 ml For 6 serial distillations	For Distilled Nitrogen
4. Kjeldahl Digestion 1 unit	58,000	Gerhardt macro 750 ml For 6 digestions	For Digested Nitrogen
5. Mot-plate 1 unit	30,000	Gerhardt Ceran-Mot plate C 450	For Digested Sample to Analyze total Phosphorus
6. Mot-plate 2 units	10,000	Gerhardt 1701 EV1	For Boiled Distilled Water to Prepared Reagents
7. Oven 1 unit	75,000	WTB binder Type 240	For Dried SS, TS & TDS
8. Vacuum/ Pressure pump 1 unit	47,000	Millipore Cat.No.XX22050	For Filter SS
9. Balance 0.000g 1 unit	38,000	Sartorius BA 310 s.	For Weighted Chemical
10. Completely Fiber-glass Fume Hood 1 set	100,000	Major Products Size 150	For Absorbing Acid Vapour
Total	835,000		

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