Expectation of Water Works Association in Lao PDR

International Water Forum: MDGs to SDGs - Sustainable water environment and Stable water supply

Presented by:
Kumphoy VONGSAKHAMPHOUI
General Manager Vientiane Capital WSSE
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**General Information**

- Vientiane capital is the Capital of LAO PDR, is situated in central part of the country with a total area of 3,920 square kilometer is covering about 1.7% of the country area.
- Vientiane Capital composes of 9 districts and 483 villages with a 850,000 inhabitants with density of 217 people per square kilometer (year 2014)
- Water supply served around 80% in service area

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**Board Organization Chart.**
Personnel

1 General Manager, 4 Deputy General, a number of staff has totally 553 persons, Permanence staff 478 persons, temporariness staff 75 persons.
Water resources

• **Mekong** river are abundant throughout the year to serve the Kaolieo and Chinaimo water treatment plants, Rainy season, turbidity was going up to 1500-2000 NTU. (August 2015 over 5000 NTU) for dry season, turbidity was going down to 15-20 NTU.

• **Nam ngum** River is one of the largest tributaries of the Mekong River, to serve the Dongmakay and Dongbang water treatment plants, Rainy season, turbidity was going around 100-300 NTU and Dry season was going down to 10 -15 NTU.

**WATER PRODUCTION 180 000 m3/day**

1. Chinaimo WTP 80 000 m3/day
2. Kaoleo WTP 60 000 m3/day
3. Dongmakkhay WTP 20 000 m3/day
4. Dong Bang WTP 20 000 m3/day
**Conventional Water Treatment System**

- **Raw water**
- **R.W**
- **F & S.B**
- **R.F**
- **P.W**
- **D.R**
- **Drainage to Mekong River**

**Coagulants**
(Poly-aluminium chloride)

**Flocculation tank**

**Chlorine**
(Post-chlorination)

**R.W**: Receiving Well  
**F & S.D**: Flocculation & Sedimentation Basins  
**R.F**: Rapid Sand Filtration Basins  
**P.W**: Pumping Well  
**D.R**: Distribution Reservoirs

**Chinaimo WTP 80,000 m³/day**
Water Quality

(a) Raw water
Turbidity: 88 PPM
Color: 5
pH: 8

(b) Tap water (treated water)
Turbidity: 0.8 PPM
Color: 0
pH: 7.2
Iron: 0 mg/l
Manganese: 0 mg/l
Hardness: 100 mg/l
Nitrate Nitrogen: 12 mg/l

Priorities of Parameters

<table>
<thead>
<tr>
<th>No</th>
<th>Parameters to be analyzed</th>
<th>Units</th>
<th>Allowable Concentration</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>pH</td>
<td></td>
<td>6.5-8.5</td>
</tr>
<tr>
<td>2</td>
<td>Turbidity</td>
<td>NTU</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>3</td>
<td>Taste and Odour</td>
<td>Acceptable</td>
<td></td>
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<tr>
<td>4</td>
<td>Conductivity</td>
<td>uS/cm</td>
<td>1000</td>
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<tr>
<td>5</td>
<td>Iron</td>
<td>mg/l</td>
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<tr>
<td>6</td>
<td>Manganese</td>
<td>mg/l</td>
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<tr>
<td>7</td>
<td>Arsenic</td>
<td>mg/l</td>
<td>&lt; 0.05</td>
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<tr>
<td>8</td>
<td>Fluoride</td>
<td>mg/l</td>
<td>&lt; 1.5</td>
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<tr>
<td>9</td>
<td>Nitrate</td>
<td>mg/l</td>
<td>50</td>
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<tr>
<td>10</td>
<td>Thermotolerant Coliform</td>
<td>No/100ml</td>
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<tr>
<td>11</td>
<td>Total Hardness</td>
<td>mg/l</td>
<td>&lt; 300</td>
</tr>
<tr>
<td>12</td>
<td>Nitrite</td>
<td>mg/l</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>Residual Chlorine in chlorinated water supply</td>
<td>mg/l</td>
<td>&lt; 0.2</td>
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WATER NETWORK and SERVICE AREA

Service Area in Vientiane Capital
The Pipeline Network Management by using a new advanced technology Arc GIS version 10.1 it was the first technology network system in Lao PDR.
Commercial and Financial Management
WATER TARIFF

1. Domestic Used
   - 1 to 10 m³ = 1300 kip/m³ (0,16 USD)       September 2014
   - 11 to 30 m³ = 1800 kip/m³ (0,23 USD)
   - 31 to 50 m³ = 2300 kip/m³ (0,28 USD)
   - > 50 m³ = 2800 kip/m³ (0,35 USD)

2. Government and International Organization
   - One flat price = 2300 kip/m³ (0,28 USD)

3. Businesses, Commercials, Industries, Hotels and Restaurants
   - One flat price = 2800 kip/m³ (0,35 USD)
   - Remark: 2015 (3%), 2016 (3%), 2017 (4%) and 2018 (5%) increase from each year

<table>
<thead>
<tr>
<th>No.</th>
<th>Category</th>
<th>Unit</th>
<th>Year</th>
<th>Compare %</th>
<th>Remark</th>
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<td></td>
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<td>2013</td>
<td>2014</td>
<td></td>
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<tr>
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<td>91,095</td>
<td>99,883</td>
<td>110%</td>
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<td>1,684</td>
<td>1,053</td>
<td>63%</td>
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<tr>
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<td>3,509</td>
<td>3,288</td>
<td>94%</td>
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<tr>
<td></td>
<td>Total</td>
<td>No.</td>
<td>97,507</td>
<td>104,224</td>
<td>107%</td>
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</tbody>
</table>
Financial
Income-Expenditure and Profit-Loss

• Income of the running business in 2014 was able to made income about 115 billion compared to the running business in the past year 2013 the revenue just 111.4 billion to the increasing rate compared the last year is 4%.

• Expenditures in the running business in 2014 was about 113.3 billion compared to 2013 was 116.1 billion the expenditures in 2014 can perform better than 2 % of last year.

• Profit - loss was that of 2014 in millions of more than approximately 2 % make doing business with profits of about 1.2 billion because the 2014 state enterprises water supply capital adjusted price rate consuming water piped new make more income description of income - expenditure is shown in the table below:

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Present and Future Project
Expansion Water Production

• Dongmakkhay 100 000 m³/day (2015)
• BOT Hatsayphong 20 000 m³/day (2016)
• BOT Sendine 20 000 m³/day (2017)
• Expansion Dongbang 20 000 m³/day (2019)
• Expansion Chinaimo 40 000 m³/day (2021)

Expansion of Transmission and Distribution Pipeline

• Loan from NORINCO China around 70 millions USD for:
  • Expansion of Distribution pipeline from Sendine BOT Project to Naxaithong District around 60 km
  • Expansion of Distribution pipeline for Dongmakkhay WTP to Surrounding Area of Saithany and Saysettha District around 80 km
  • And Change GRP 500 mm to 800 mm DIP Dongbang Project around 8 km
Challenges in Vientiane Capital WSSE

- Coverage 95% the service area in 2020 (now only 80%)
- The Capacity demand will be increased up to 400 000 m³/day in the 2020 (now only 180 000 m³/day)
- The old pipelines will be changed more than 60 km
- The staffs Lack of experience for advanced Technical management, Electrical of pump Production,
- Lack of fund to expansion pipe line and replacement old pipe and water meter.
- Storage management (have a lot categories of pipe in the past)

Expectation of Water Works Association in Lao PDR in comparison with JWWA

Activities of JWWA

1. Research on Water Supply Business Management
2. Research on Technology in Water Supply
3. Publication
4. Training
5. International Cooperation
6. Inspection
7. Authorization
8. Insurance

Prioritized activities of WWA in Lao PDR from VC WSSE’s view

- Training system by LWWA
- International cooperation
- Inspection of spec & standard
- Support some fund