

GREATER ACCRA REGION – WEIJA-CANDY System Profile
System R01A/S04 No 2C

1. General

The Weija water supply system is divided in three sub-systems: Weija-Adam Clark (Canadian-New Works), Weija- Candy and Weija-Bamag.

The common raw water source of the three sub-systems is the impoundment created by Weija Dam, with a storage volume of 115 Mcm.

The reservoir supplies 2 No. raw water pumping stations, the Canadian Pump House and the Old Pump House.

The three treatment plants are all of conventional type, including aerator (not all), clarifiers, filters, chemical plants, storage. The treated water is supplied by gravity to the service area.

2. Population and Water Demand

Weija supplies Accra Rurals D and E and with New Kpong the Accra metropolitan area as shown in the table below.

The population served by Weija is not known when preparing this system profile, however this proposal considers only the rehabilitation of the system to restore its design capacity.

SYSTEM NAME	No.	LOCALITY NAME	ESTIMATED POPULATION					PROJECTED WATER DEMAND (M3/DAY)			
			2005	2007	2011	2015	2025	2005	2,007	2011	2015
Old Kpong	1	Accra Rurals A	232,891	249,830	287,597	331,228	472,424	10,647	11,716	15,099	18,289
Old Kpong	1	Accra Rurals B	80,971	85,458	95,209	106,099	139,245	4,056	4,359	5,746	6,774
Old Kpong	1	Accra Rurals C	70,158	73,723	81,406	89,891	115,184	4,606	4,913	5,852	7,218
Weija	2	Accra Rurals D	32,842	35,522	41,556	48,615	71,962	2,080	2,628	3,410	4,135
Weija	2	Accra Rurals E	28,126	30,224	34,914	40,353	58,077	1,673	1,826	2,203	2,654
		Total Accra Rurals	444,989	474,757	540,682	616,185	856,891	23,063	25,442	32,310	39,070
New Kpong	1	Accra Met	649,340	695,589	798,205	915,958	1,292,050	58,645	64,095	78,064	93,039
Weija	2	Accra Met	1,106,016	1,184,792	1,359,576	1,560,145	2,200,739	95,312	104,141	125,850	155,418
New Kpong & Weija	1&2	Accra Met	215,000	230,313	264,290	303,278	427,804	19,512	21,275	26,013	30,930
		Total Accra Met	1,970,356	2,110,695	2,422,071	2,779,382	3,920,593	173,468	189,511	229,927	279,387

3. Existing Surface Water Supply System

3.1 Dam and Intake

See Weija – Adam Clark sub-system.

3.2 Old RWPS

See Weija – Bamag sub-system.

3.3 Candy Water Treatment Plant

This was constructed in the 1950's. The plant design capacity is 39,740 m³/day (8.75 mgd). It receives the raw water from the West German (Old) raw water pumping station. Treatment process comprises flocculation, sedimentation in hopper-bottom sedimentation tanks, and rapid gravity filtration. It has 16 No sedimentation tanks and 8 No Rapid Gravity Filters, after which the water is chlorinated using chlor gas or calcium hypochlorite. The treated water is temporarily stored in a 4,500 m³ (1 mg) Clear Water Reservoir, and serves the western and eastern parts of Accra under gravity, together with the other 2 plants. Filter runs on this plant is 24 hours.

Construction and Operational Details:

- The raw water reaches the open, cylindrical, reinforced concrete raw water tank, with a capacity of 4,500 m³; downstream, a distribution chamber is provided, where a dry alum feeding installation is installed.
- The 16 No. clarifiers are of hopper bottom type, provided with manual desludging valves; the valves are very old and some of them need to be replaced;
- The sludge from the clarifiers, as well as the waste backwash water from the filters is not recycled;
- The 8 No. filters are of rapid gravity type, of main pipe and laterals type. The flow regulating system is out of order. All valves are manual. The backwash system is by means of scour air and backwash water. The following equipment is installed in the filters bottom gallery:
 - 2 No. scour air blowers Roots-Holmes Dresser, Q=23 m³/min, p=0.5 bar, with Marelli, P=30 kW, n= 1,475 rpm motors;
 - 2 No. backwash pumps of suction end type, Jeumont Schneider Q=1,296 m³/h, H=13m, n=1,450 rpm, with electric motors Brook Crompton, P=75 kW;
 - 2 No. service water pumps of suction end type;All the equipment is in good order.
- Clear Water Tank: it is an underground reinforced concrete structure, with a capacity of 4,500 m³.

3.4 Transmission, Storage and Distribution

This system was briefly described at Weija-Adam Clark water treatment plant.

3.5 Rehabilitation / Expansion Works Carried out/on going/Planned

Presently there are not on-going rehabilitation/ expansion contracts for this sub-system.

4. Proposed Rehabilitation (2008) and Expansion (2011)

4.1 General

The system will continue to be based on surface water abstraction, pumping, conventional treatment, storage and distribution.

The capacity of the system will be returned to the design one of 39,740m³/day, by means of the recommended rehabilitation/expansion works.

The system will continue to serve the same service area.

During the rehabilitation/ expansion proposed works, remedial works will be carried out in the RWPS and treatment plant. The transmission mains, storage and distribution system are being developed under an on-going construction contract (see Weija-Adam Clark system profile; since details of this contract are not available, no recommendations are given here for this part of the system.

4.2 Supply Vs Demand

Year	2008	2011	2015	2025
Water demand (m ³ /day)				
Present design capacity (m ³ /day/ mgd)	39,740/8.75			
Present water production (m ³ /day/ mgd)	32,400/7.1			
Expected water capacity after rehabilitation/ expansion (m ³ /day/ mgd)	39,740/8.75	39,740/8.75		

4.3 Dam, Intake and RWPS

The recommended works for the Dam and Intake have been included in Weija-Adam Clark system profile.

The recommended works for the RWPS have been included in Weija-Bamag system profile.

4.4 Candy Water Treatment Plant

Rehabilitation 2008:

- Replace of clarifiers faulty valves;
- Replace of filters faulty valves;

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- Supply and install filters flow control system;
- Supply and install complete system of sampling pumps and appurtenances.
- Supply and install complete new starters for air blowers and backwash pumps.

Expansion 2011: no works are recommended.

5. Scheme Components and Estimated Costs

The basic data and cost estimates of rehabilitation and expansion of Weija Candy treatment plant are shown in Tables 2C.0, 2C.1 and 2C.2.

6. Proposed Scheme for 2015 and 2025