水務署
Water Supplies Department

行政大樓

化學原料倉

明礬池

經處理水抽水站

洗池水均衡池

中華電力公司
變壓站

漁波導管

沉澱池

濾水池

臭氧樓

液體氧氣儲存缸

維修物料倉

濾料存放倉

淤泥濃縮池

氯氣倉

淤泥脫水樓

原水抽水站

入口

往牛潭尾

水務署
Water Supplies Department

牛潭尾

濾水廠

牛潭尾濾水廠於2000年啟用，為元朗、天水圍、牛潭尾、新田、米埔等一帶提供食水，每日的濾水量達23萬立方米，日後可增至每日45萬立方米。牛潭尾濾水廠是本港最先進的濾水廠，糅合了尖端的濾水科技，包括首次在本港濾水過程採用粒狀活性碳生物濾池，輔以臭氧處理技術。濾水廠只佔地12公頃，大部分設施均互相靠近，沉澱池更採用了三層式設計。

1 原水

牛潭尾濾水廠處理來自廣東東江的原水。

2 預加臭氧及混合化學品

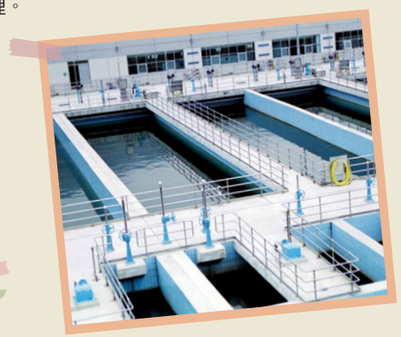
原水先在預加臭氧接觸池加入臭氧，以局部氧化雜質、抑制水藻的生長及消除水中氣味。預加臭氧的原水會接著在進水池和快速攪拌池內混入下列化學品:

- 熟石灰 - 在投放明礬前調節水的酸鹼度
- 明礬 - 使水中雜質凝聚成較大顆粒

此外，尚有設施用作混入粉狀活性碳和聚電解質，以分別進一步控制水中氣味和加速水中雜質的凝聚，增強沉澱效果。絮凝的雜質會凝聚成較大的顆粒。

3 凝聚及沉澱

混入化學品後，水會流入絮凝池，而經絮凝的雜質會凝聚成較大的顆粒。沉於三層沉澱池中成為污泥，然後經收集運往污泥濃縮池再作處理。



4 中段臭氧化及生物過濾

水經過沉澱池後會流入中段臭氧接觸池，以便把剩餘的雜質氧化、增加溶解氧量，並進行初步消毒。經中段臭氧化的水會流入初級生物濾水池，以除去水中體積較小的顆粒及清除部分氨和有機物質。至於濾水池，將會定期以壓縮空氣和水以反沖方法進行清洗。過濾後的水會接著流入次級生物濾水池，利用粒狀活性碳以生物處理方式清除氨及有機物質。此外，尚有設施用作混入營養化學品，以維持濾水池內的生物活動。

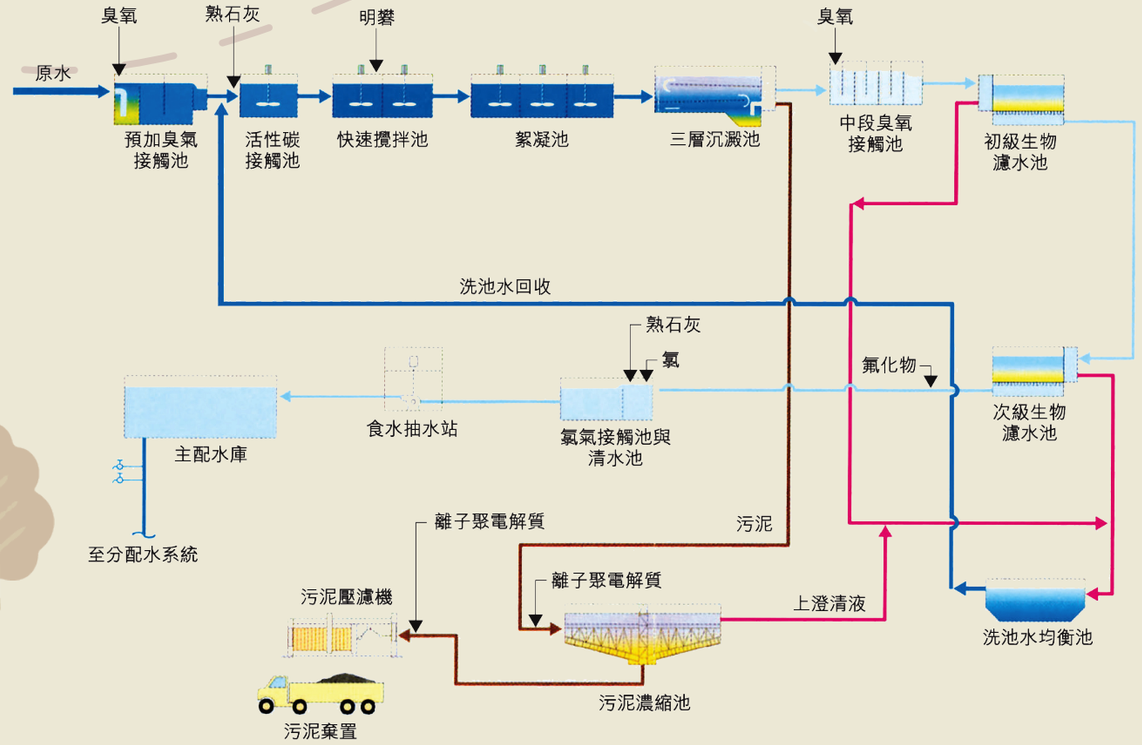
5 清水池

經生物濾水池處理的水會在接觸池內加入氯氣及熟石灰，分別用以消毒及提高經處理的水的鹼度以防止喉管腐蝕，並會加入氟化物保護牙齒。經處理的水會流入清水池儲存，然後泵送到主配水庫，再分配給用戶。

6 抽水設施

牛潭尾濾水廠的食水抽水站設有4個食水泵，每日抽水量達307, 200立方米。

食水處理過程



7 環保設施

濾水廠採取了環保措施，以節約用水。洗池水均衡池收集濾池洗水，混合原水循環再用。濾水過程產生的污泥會送到污泥濃縮池，以聚電解質作為絮凝劑進行濃縮。經濃縮的污泥會由薄膜型壓濾機壓成泥餅，然後運往堆填區棄置。在美國環保工程師學會舉辦的2001年卓越環保工程比賽中，該廠於設計、策劃、研究、運作/管理等6個組別的所有參賽項目獲得最高評分，榮獲「卓越成就大獎」。這是首次有美國以外的設計項目贏得該學會頒發的最高殊榮。

8 水質控制

水務署會透過抽取水樣本作化學、細菌及生物化學，密切監察水質，以確保水質符合世界衛生組織建議的飲用水水質指引，並為市民提供安全衛生的食水。

水務署
Water Supplies Department

Administration Building

Chemical Building

Alum Saturation Tanks

Treated Water Pumping Station

Washwater Equalization Tanks

China Light & Power Sub-Station

Surge Tanks

Sedimentation Tank

Filter

Ozone Building

Liquid Oxygen Tanks

Maintenance Storage Building

Filter Media Storage House

Sludge Thickeners

Chlorine Building

Dewatering Building

Raw water Pumping Station

Entrance

To Yau Tam Mei

水務署
Water Supplies Department

Ngau Tam Mei

Water Treatment Works

Ngau Tam Mei Water Treatment Works provides a treated water supply to Yuen Long, Tin Shui Wai, Ngau Tam Mei, San Tin and Mai Po areas. It was first commissioned in 2000 with a treated water output of 230,000 cubic meters per day with provision for future expansion to 450,000 cubic meters per day. The water treatment works is a state-of-the-art treatment works in Hong Kong. It incorprate the most advanced treatment technologies including the first use in Hong Kong of Granular Activated Carbon (GAC) biological filters enhanced by ozonation in the treatment process. The treatment works only occupies 12 hectares, most of the units are closely located and triple-deck sedimentation tanks are adopted.

1 Raw Water

The raw water treated by the Ngau Tam Mei Water Treatment Works comes from Dongjiang water of Guangdong.

2 Pre-ozonation and Mixing

The raw water is first ozonated in the pre-ozone contact tanks to partially oxidise the impurities, control algae growth and remove taste and odour. The pre-ozonated water is then dosed at the inlet basins and rapid mix tanks with the following chemicals:

- Hydrated Lime — to pre-condition the water pH prior to addition of alum
- Alum — to coagulate impurities

Facilities are also available to dose powdered activated carbon and polyelectrolyte for further control of taste and odour and for aiding the coagulation and flocculation of impurities respectively.

3 Flocculation and Sedimentation

After mixing, water is passed to the flocculation basins where coagulated impurities aggregate into large particles and settle as sludge in the triple-deck sedimentation tanks. The sludge is collected and conveyed to sludge thickening tanks for further treatment.

4 Intermediate Ozonation and Biological Filtration

The settled water from the sedimentation basins flows to the intermediate ozone contact tanks for oxidation of remaining impurities, enrichment of dissolved oxygen as well as for primary disinfection. The intermediate ozonated water flows to the first stage bio-filters for removal of the more finely divided particles and for partial removal of ammonia and organic matter. Periodically the filter beds are cleaned by backwashing with compressed air and water. The filtered water is then passed through the second stage biological filters containing Granular Activated Carbon (GAC) for biological removal of ammonia and organic matter. Facilities are available to dose nutrient chemicals to maintain the biological activity in the filter beds.

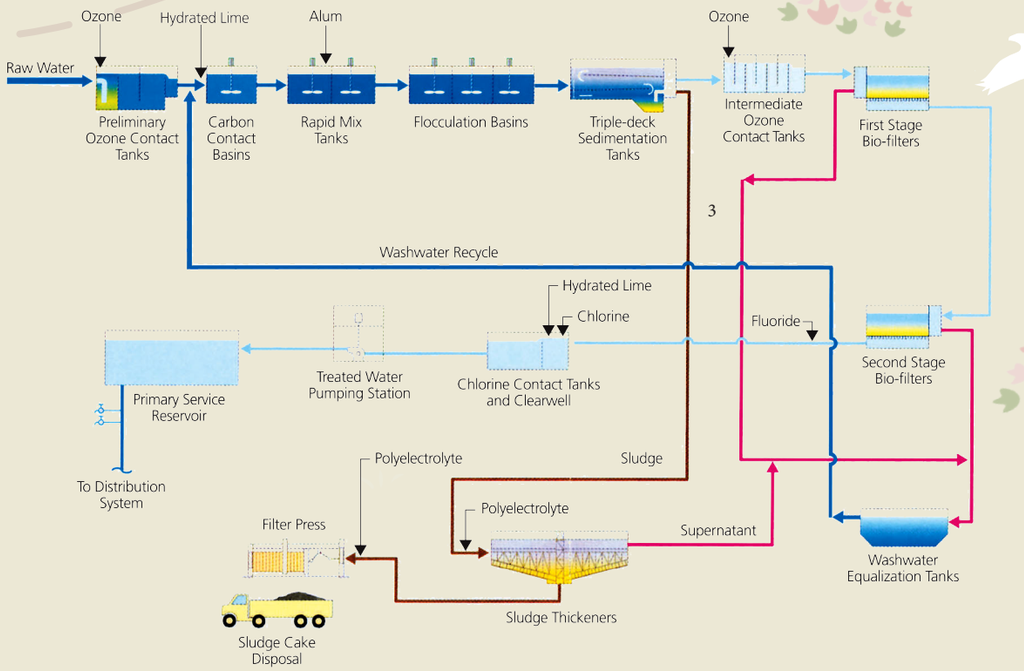
5 Clear Water Tanks

Chlorine and hydrated lime are dosed into the biologically treated water in the contact tanks for disinfection and increasing the alkalinity of the treated water for corrosion control respectively. Fluoride is dosed for dental protection. The treated water is stored in the clear water tanks and then is pumped to the primary service reservoir for distribution to the consumers.

6 Pumping Facilities

The treated water pumping station in Ngau Tam Mei Water Treatment Works has 4 treated water pumps with a pumping capacity of 307,200 cubic meters per day.

The Water Treatment Process



7 Environmental-friendly Facilities

Environmental protection measures are taken to reduce waste. The washwater equalization tanks collect the filter backwash water for recycling after combining with raw water. Sludge produced in the water treatment works is thickened in the sludge thickeners using polyelectrolyte as flocculant. Thickened sludge is pressed by filter membrane-type press into cakes for disposal at landfill sites. The plant gained the prestigious “Superior Achievement Award” from the American Academy of Environmental Engineers (AAEE) in 2001. The project scored the highest among all entrants in all 6 categories including design, planning, research, operations/ management. It was also the first time that a design project outside the USA has won the top award from AAEE.

8 Water Quality Control

The quality of water is closed monitored by means of chemical, bacteriological and biological examinations of water samples taken to ensure compliance with the Guidelines for Drinking Water Quality recommended by the World Health Organisation, and to ensure a safe and wholesome potable supply.