CASE HISTORY

SEMICONDUCTOR
SOLAR
PHARMA
POWER GENERATION
FOOD & BEVERAGE
PULP AND PAPER
CHEMICAL
OIL AND GAS
MINING
AEROSPACE AND TRANSPORT

HAGER+ELSÄSSER

An aquarion Group Company

Inspectorate International Ltd

Metals Removal

1 The Project

Inspectorate International Ltd., a subsidiary of Inspicio PLC, analyses samples of mineral ores from all over the world in its test centre in Essex. Each sample has to be dissolved in acid before analysing. This in itself creates substantial volumes of wastewater. Of course, the ores tested are metal-containing, which adds to the environmental issues, and for many years Inspectorate have owned and operated an effluent treatment plant. However, they also need to use mercury-containing chemicals in their analytical processes. The use of mercury within the factory has always been very carefully controlled and monitored, and their treated water quality has long been viewed as satisfactory. However, recently they were advised of a planned reduction in the allowable mercury in the treated water discharge. It was immediately clear that the existing treatment plant would not be able cope with the new demand, in addition to which it was some 30 years old.

Mercury Removal Filters

Since the target for mercury concentration in the treated effluent was only 10µg/l (10 parts per billion), sample trials were done to verify the selected treatment method. Once independent analysis had confirmed this, plans for the new plant were finalised.

The new plant was to be built in the same space as the existing one, so the Project Management included a detailed programme for waste management during the build process, demolition of the old plant, refurbishment of the building and then building, testing and commissioning of the new plant.

The new treatment plant includes the following main elements:

1. Effluent collection sump & transfer pumps
2. Effluent Balance tank & plant feed pumps
3. Neutralisation and Flocculation systems
4. Lamella tube clarifier
5. Sludge collection & partial dewatering tank
6. Sludge filter press system
7. Continuous gravity tertiary sand filter
8. Final pH adjustment system
9. Final transfer systemFine filtration systems
10. Mercury removal filters
11. Discharge flow and pH monitoring & recording
12. Chemical storage & automatic dosing systems
13. Fully automated control system
14. Health & Safety equipment

The programmed work was completed in two weeks less than the programmed time.

The effluent quality is monitored regularly, before, during and after the treatment process.

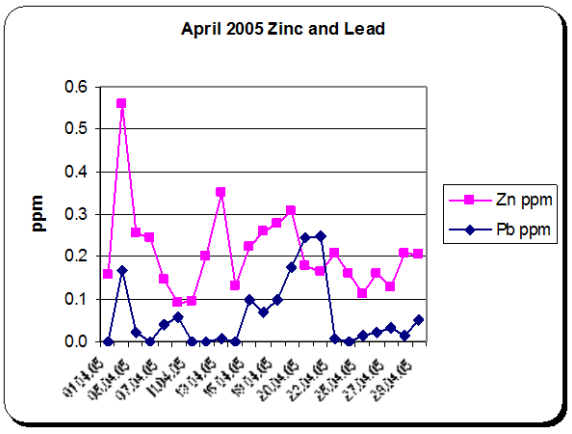
The revised Discharge Consent conditions from the Environment Agency are:

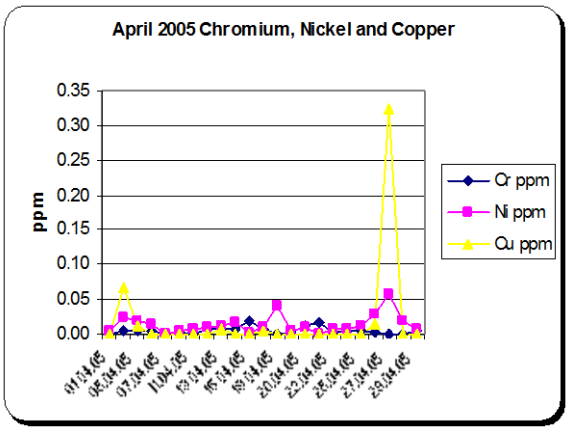
Parameter	Value	Parameter	Value
pH	6-10	Lead	<1mg/l
COD	<600mg/l	Chromium	<2mg/l
Mercury	<50µg/l (target 10)	Nickel	<5mg/l
Cadmium	<25µg/l	Suspended Solids	<400mg/l
Copper	<5mg/l	Sulphate	<1000mg/l
Zinc	<10mg/l		

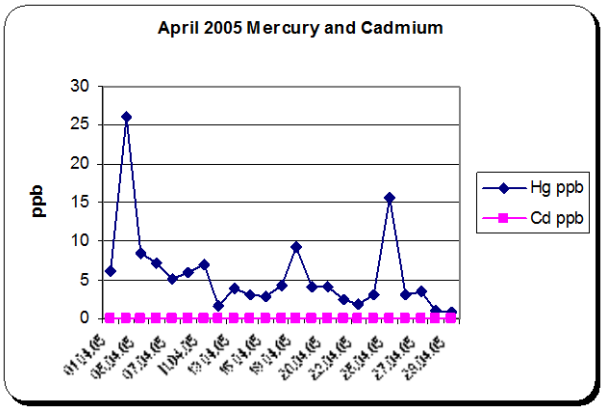
The following graphs show results obtained over a one month period, nearly one year after the new plant was commissioned. The results are typical of those obtained each month:

The following graph shows very clearly that the plant normally achieves the target of 10ppb for mercury. It also clearly demonstrates that at these tiny concentrations, the slightest lack of attention in plant operation will see the concentration in the discharge rising towards the limit. Therefore the operational procedures used in normal operation are immensely important.

In addition to building the plant, H+E provides long-term technical support to Inspectorate to ensure that the system continues to operate in the future.







H+E ranks among the world's leading suppliers in the fields of: water & wastewater treatment, and energy efficiency. Based on its global presence, the **H+E** **GROUP** has completed projects in over 50 countries.

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