



## SHIJIAZHUANG IRON & STEEL COMPANY LIMITED

### Water Conservation and Recycling

#### SUMMARY OF THE OPTION

Shijiazhuang Iron & Steel Co., Ltd. (“Shigang”) is a state-owned integrated steel plant located in Shijiazhuang city, the capital of Hebei province in China and produces 2 million tons of carbon structural round steel per year.

In Shijiazhuang city, the depletion of water resources is becoming a serious concern. About 20 years ago, the aquifer’s water table used to be 30 meters below the ground surface. Today, it is 70 meters below the surface. And the plant’s water consumption is steadily rising with increased steel production. with wastage of water existing in some production processes. . In order to save water resources, the Company set up the project “*Zero discharge of water*”, which was largely promoted by the GERIAP project. Options implemented under this project that resulted in the highest water savings were establishment of water recycling system, redesign of the water system in the No. 1 rolling mill, and recovery of rewashing water from two power soft water stations. The investment cost of this project was about US\$ 450000, annual savings were about US\$ 300000 and the payback period was about 1.5 years. It also had good environmental benefits, with more than 650000 tons of water being saved every year. The project improved the water reuse rate and reduced fresh water consumption and water discharge. Energy consumption and costs and associated greenhouse gas emissions were only reduced indirectly and this was not quantified. The *Zero discharge of water* project will continue in the future.

#### KEY WORDS

China, Iron and Steel, Water, Pipeline, Pumping Station

#### OBSERVATIONS

In Shijiazhuang city, the depletion of water resources is becoming a serious concern. About 20 years backago, the aquifer’s water table used to be 30 meters below the ground surface. Today, it is 70 meters below the surface. And the plant’s water consumption is steadily rising with increase in productivity, with wastage of water existing in some production processes.

Aquifer water consumption on site is 600,000 m<sup>3</sup>/month, from 6 wells. All wells have flow meters. The plant pays 1.5 Yuan Rmb/tonne of this water, compared to 3.0 Yuan Rmb/tonne for water from the municipal supply pipeline. In 2003, total effluent wastewater discharged from the site was 156,000 m<sup>3</sup>/month (i.e. 25% of all water used on site). A new wastewater treatment plant is now being planned.

During the assessment of the plant, varying degrees of high use and wastage of water existed in some production processes:

- The cooling water from the iron-making blower and hydraulic pressure station was directly discharged and wasted
- The No. 1 rolling mill was set up long ago and the water system design was inappropriate.
- Many equipment used fresh water as cooling water and the water was discharged after use.
- The rewashed water in the #1 and #2 power soft water station was directly discharged.



It was observed that all wells in the company have flow meters, however, some of them were not functioning normally.

## **OPTIONS**

In view of the high use and wastage of water in some production processes, the Company set up the project “*Zero discharge of Water*”. The GERIAP project provided the incentive for the implementation of this project. The details are as follows:

- To recover the cooling water from the iron-making blower and hydraulic pressure station, the Company set up an independent water recycling system with annual water savings of 320 thousand tons.
- To improve the water system in the No. 1 rolling mill, the Company made great effort to reconstruct it with an annual water savings of 300 thousand tons.
- The rewashing water from the #1 and #2 power soft water stations is separately recovered in a residue-rinsing pool, thus reusing water onsite, with annual water saving of 30 thousand tons.
- The cleansing system in the No. 2 rolling mill was reconstructed and water spill was reduced.
- In addition, water used by the air conditioning system was also recycled.

To assist with future management of water, water meters were calibrated and repaired and in 2004 a water balance was established for the cooling towers.

## **RESULTS**

### **Financial benefits**

- Investment: US\$ 450000
- Annual cost savings: US\$ 300000
- Payback period: 1.5 years

### **Environmental benefits**

- Annual water savings: more than 650000 tons
- Reduction in wastewater
- Water pollution will be reduced indirectly
- Electricity for pumping water, and electricity and chemicals for the wastewater treatment plant are reduced

## **FOR MORE INFORMATION**

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