

# pipe world

**FRANCHISING FACTORY  
READY FOR  
OPERATION IN LIBYA  
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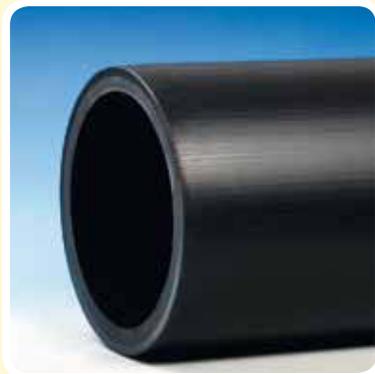
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**MULTILAYER  
SOLUTIONS CAN  
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# Add a layer of protection to your industrial operations



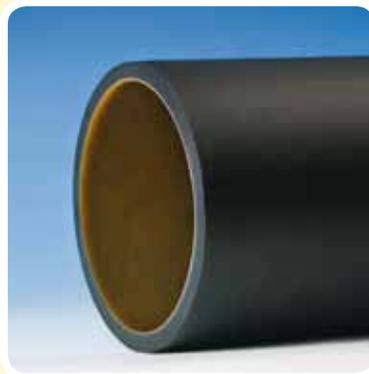
## **WehoSlurry**

Superior abrasion resistance



## **WehoAntistatic**

Safe transportation of flammable substances



## **WehoChem**

Cost-efficient transportation of industrial chemicals

Durability, flexibility, corrosion resistance and long lengths – All of the advantages of PE-HD plus a customized polymer layer. Read more on [www.kwhpipe.com/fps](http://www.kwhpipe.com/fps)

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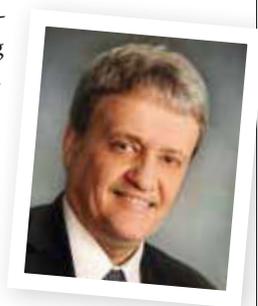
# KWH PIPE OFFERS YOU SO MUCH MORE

**K**WH Pipe's factories around the world produce huge quantities of pipe every year. However, we feel that our responsibility does not end here. Although our plastic pipes do a fantastic job for a large number of customers, in many cases there is a lot more to a successful project. Our experience in design, laboratory testing and installation is one of the reasons why so many customers choose to work with us. They know that involving our experts at an early stage can give them a pipe system that fulfils their requirements at optimal total lifecycle cost. We have experienced situations where customers that had previously only worked with concrete or metal pipes have converted to plastic pipes and never looked back since their expectations were more than met.

We have recognized that our customers' success is also our success and that success can only be achieved if we remain dedicated to professionalism and quality in everything we do. In order to be able to provide added value for the customer, we invest a considerable amount of time in understanding the customer's processes and requirements. We cannot emphasize enough the importance of cooperation between all stakeholders. The best way to guarantee a successful project is to involve designers, consultants, contractors and the customer and examine all contributing factors with them. In many cases we also install the pipes ourselves or provide supervision in order to ensure that all steps of the project are carried out with the same dedication to quality.

In this issue of Pipe World, we present projects that contribute to economic progress and environmental protection. This is a snapshot of the hard work we are carrying out every day to help our customers and partners to succeed.

**Jan-Erik Nordmyr**  
President & CEO, KWH Pipe Ltd



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## Blue pipes for Hong Kong water

The Water Supplies Department of Hong Kong Special Administrative Region Government is responsible for providing a reliable and clean water supply for seven million people every day. In a densely populated area, largely situated on islands, this is no easy task.

However, the Department is known for its dedication to studying and finding the best solutions for water treatment, maintaining high water quality and developing water supplies. An interesting fact is that, in order to save drinking water, there's a separate seawater supply system used for flushing toilets, accounting for about 15% of total water use.

By adhering to strict standards, Hong Kong meets the World Health Organization's guidelines for drinking wa-

ter quality and produces drinking water that is among the safest in the world. KWH Pipe's subsidiary in Thailand, Wiik & Hoeglund Plc., has been able to meet these high standards. Blue PE-HD pipe in dimensions DN/OD 25–355 mm, produced and bar-coded under the BS EN12201 and ISO4427 standards, has been accepted for the purpose. These pipes are contaminant-free, long-lasting and UV resistant, they withstand pressures up to 16 bars and have superior resistance to slow and rapid crack growth propagation. Furthermore, they can be recycled to make the best use of the earth's resources. ■



## London's water system upgrades with Weholite

**The UK's largest water and wastewater services company is upgrading its process system to improve the drinking water supply to more than 1.1 million residents across London and the Thames Valley.**

Thames Water has invested £11.3 million in overhauling and upgrading the drinking water processing system on its site at Walton-on-Thames in Surrey. The project, which will allow an extra 55 mega litres of water through the system each day, will use leading water management solutions provider and KWH Pipe's Weholite licensee, Asset International Ltd, to provide structured-wall PE-HD pipes for use in the bulk recycle pipeline.

Engineering, consulting and construction company, Black & Veatch, opted for the Weholite pipes manufactured by Asset. Black & Veatch's Site Manager, **Max Turnbull**, said: "Weholite pipes are lightweight and therefore are easy to handle, which saves us time and money that would have been spent on heavy lifting equipment when laying the pipes."

The current pipe system at the site distributes 80 mega litres of water a day to London and the Thames Valley, the new larger 1.2 metre diameter pipes will allow the water treatment works to provide 135 mega litres of water on an average day and 165 mega litres at peak times.

Weholite was proven to have a lower carbon footprint than many other traditional pipe materials thanks to a number of factors including its UK manufacture and its lightness, which re-

sults in reduced transport costs and much less requirement for heavy-lifting machinery on site for installation.

Project Manager at Thames Water, **Mark Bulpett**, said: "Thames Water has successfully worked with Asset on a number of previous projects. On projects such as this we always look for the pipework to be a high quality product that is cost-effective and right for the job."

"Plastic pipes are lightweight, so they remove a number of health and safety issues when it comes to handling them, and for us that is a definite bonus."

Weholite pipes are extremely versatile, which allows them to be easily managed on site as slots are inserted simply into the plastic for quick placement.

Managing Director at Asset International,

**Simon Thomas**, said: "We are delighted that Thames Water and Black & Veatch chose our Weholite pipes to complete their project at Walton-on-Thames."

"We have successfully completed around 10 drinking water projects across the UK over the last three years. Working with the major water companies, including Thames Water, Wessex Water, Anglian Water, Welsh Water and Scottish Water, has given us experience of the industry, an insight into site conditions and into what both the water companies and contractors are looking for.

"The Weholite system is becoming the product of choice for new projects and upgrades within the water industry, thanks to its high quality, sustainability and design in value engineering aspects." ■



## New Weholite licensees

In April 2010, TecPipe SA entered into a Weholite Licensing Agreement with KWH Pipe regarding Weholite's activities in Chile. The tradition of manufacturing Weholite in Chile goes back to the year 2003. TecPipe is now operating in new facilities in Colina at Ruta North close to Santiago. In addition to Weholite ranging from dimensions DN/ID 400 to ID/DN 2,200 mm, TecPipe also manufactures PE-HD pressure pipes DN/OD 315–1,200 mm, using pipe production equipment supplied by KWH Pipe Technology.

In Iceland, SET Pipes Ltd has signed a Weholite Licensing Agreement as of April 2010. SET is a fully integrated pipe manufacturer involved in the innovation, design, manufacture and marketing of a diversified range of PVC, PP, PE and preinsulated pipe systems. The company is the only manufacturer of plastic pipes in Iceland after the acquisition of the plastics pipe operation from Reykjalundur Plastic in 2009.

Weholite is a well established pipe system involving pipes and prefabricated products, such as tank systems and manholes, and has operated in Iceland since 2002. The pipe factory, situated in Mosfellsbaer very close to Reykjavik, manufactures Weholite in the size range DN/ID 280–1,200 mm.

For more information about TecPipe and SET, please visit [www.tecpipe.cl](http://www.tecpipe.cl) and [www.set.is](http://www.set.is).

## DIN CERTCO approval for PEX pipes

KWH Pipe's PEX pipes for floor heating and radiator systems have been granted the German DIN CERTCO approval. In addition, KWH Pipe had already prior to this received the Nordic Poly Mark / Insta-Cert approval for hot and cold water installations. The company's own brand PEX products are mainly sold in Finland and include WehoFloor (floor heating system), WehoRadi (radiator applications), WehoSani (tap water) and WehoMelt (snow melting system for walkways etc).

KWH Pipe began marketing PEX systems in Finland in 1991. After gaining this experience, the decision was made to invest in its own, in-house PEX production. Since 2006, the ISO 9001:2008 certified factory has been producing PE-Xa pipes using the IR crosslinking method.

As the popularity of PEX pipes continues to grow around the world, KWH Pipe also offers the possibility of OEM production for companies looking to enter the market or searching for an alternative supplier. Should further certifications be required, KWH Pipe is willing to work with the customer to achieve such approvals.

Read more about OEM production of PEX pipes on [www.kwhpipe.com](http://www.kwhpipe.com). ■

## APPOINTMENTS

### KWH Pipe Holding

**Mr. Alf Hjerpe** has been appointed Manager of Quality, Safety and Environment for KWH Pipe Ltd's operations in Finland as of 1st August 2010. He will also continue as member of KWH Pipe Finland's management team.



Alf Hjerpe



Ari Sillanpää

### KWH Pipe Europe

**Mr. Ari Sillanpää** has been appointed Product Manager, Development of prefabricated products, Europe, as of 15th March 2010. Ari is responsible for development and standardization of production methods and products in the prefabrication activities in the European units. Ari is located in Vaasa, Finland.



Dainius Grigas



Edyta Zalewska

### KWH Pipe Lithuania

**Mr. Dainius Grigas** M.Sc. (Eng.) has been appointed Sales Manager as of 7th June 2010. He has previously worked as a Sales Director at JSC Onninen.



Robert Krysiak



Ville Mäkelä

### KWH Pipe Poland

**Mrs. Edyta Zalewska** M.Sc. (Eng. Econ.) has been appointed Industry Sales Director and a member of the management team at KWH Pipe Poland as of 1st January 2010. She has previously worked as a Regional Sales Manager at KWH Pipe Poland.



Anders Andtbacka



Tomi Lempinen

**Mr. Robert Krysiak** M.Sc. (Eng.) has been appointed Sales Director and a member of the management team at KWH Pipe Poland as of 1st January 2010. He has previously worked as a Wholesales Manager at KWH Pipe Poland.

### KWH Pipe Finland

#### CUSTOMER SERVICE

As of 3rd May 2010 **Mr. Ville Mäkelä** has been responsible for the Finnish customer service department. He also continues as a Sales Manager for Building Technology.



Mika Ohvo



Andreas Rasmus

#### TECHNICAL SUPPORT

**Mr. Anders Andtbacka** has been appointed Product Manager for the products produced in the Vaasa factory as of 1st June 2010.

**Mr. Tomi Lempinen** has been appointed Product Manager for the products produced in the Ulvila factory as of 1st June 2010.

#### VAASA FACTORY

**Mr. Mika Ohvo** has been appointed Production Manager for the Relining department in Vaasa as of 1st June 2010.

**Mr. Andreas Rasmus** has been appointed Production Manager for the solid wall pipes in the Vaasa factory as of 2nd August 2010.



# Pipe factory ready for operation in Tripoli

**Even the unexperienced can produce quality plastic pipes if a piping industry pioneer supplies the factory and trains the staff. The KWH Pipe franchising factory will soon begin its operations in Libya.**

**R**efreshing water gushes from the taps of Tripoli even though sands are blown from the Sahara desert nearby. This is not some mirage seen by someone gasping for a drink. Fresh water flows into the towns and cultivated areas from an underground lake that was discovered in the desert in 1953 whilst searching for oil.

Libya's colossal water project began around twenty years ago when the first five-metre concrete pipes were laid in the ground. Now, Libya has the world's largest underground network of water pipes and wells, which is being repaired and extended.

As well as improvements to the infrastructure, residential buildings, offices and industrial plants are being built at an incredible rate in the country. An increasing number of international companies have been involved in the construction projects in recent years.

"Also, KWH Pipe is well known in Libya. We have already been selling pipes to big projects for many years with the help of our local agent", says **Kari**

**Punnonen**, Director of KWH Technology, Vaasa.

Next year, similar pipes will be manufactured and sold by a local company too, which Lidco, Libyan Investment & Development Company, is setting up. The factory to be built in Tripoli will operate under the trade name KWH Pipe, and it has undertaken to produce items of a quality worthy of its name.

## **A whole factory purpose-built**

The state-owned investment company Lidco is one of the most important developers in Libya. The company is known for its construction work in particular, but it has also recently become a producer of building materials. Around thirty buildings that remained empty on the outskirts of Tripoli are awaiting Lidco's upcoming factory projects. In one of these, fibreglass piping is already being manufactured, and in another, marble slabs and tiles.

Also situated in the area is a building set aside for the pipe factory. The building's interior will

KWH Pipe Technology's Project Manager Simo Sewon (in the picture, left) is testing the extruder with Markku Finne.



## LIBYA IS PREPARING ITSELF FOR INTERNATIONAL BUSINESS

Libya, or The Great Socialist People's Libyan Arab Jamahiriya, opened up politically and economically in the first few years of this millennium. The United Nations removed the economic sanctions against Libya in 2003, after which the country began to attract international businesses. Libya's economy is still largely controlled by state companies, and it is still very much reliant on oil revenues.

be rebuilt totally from scratch from the floor upwards. KWH Pipe has designed the factory and produced the pipe extrusion equipment as well as the majority of the other machines that are needed for the manufacture and quality control of the plastic pipes. In addition, the company will supervise the installation work.

"We will be able to start installing things in October once Ramadan is over", Kari Punnonen estimates.

### Professional skills via training

KWH Pipe has naturally grown into a large-scale franchising business via licensed manufacturing. The license holders are typically factories already operating in the industry that have widened their range with Weholite pipes. They have acquired the production line for the pipes, training and the right to use the trademark from KWH Pipe. At the same time, they have undertaken to comply with the company's quality requirements.

Lidco differs in that the company has no experience of the pipe industry at all. Overall, in this oil-producing country, there is very little other work in the plastics industry. **Fredric Tidström**, who is responsible for KWH Pipe Technology's franchising and licence operations, will ensure that the knowledge and skills spread in Tripoli in time.

"We began the collaboration last autumn when the factory's future management team came to Finland for training", Tidström says.

KWH Pipe's specialists familiarized them with polyethylene and organizational management. The factory's other personnel will be trained in Tripoli straight away once the machines have been installed.

"We teach everything from the procurement of raw materials to sales", Kari Punnonen sums up.

He has also followed the recruitment of local employees at close quarters.

"We have also discussed the idea that Lidco could take a factory manager from us during the initial phase."

Regardless of the selection of personnel, the factory will be able to use KWH Pipe's technical support services as well as their comprehensive instruction manuals.

### Development using oil reserves

The Lidco factory will in due course produce both pressure pipes and Weholite pipes for Libya's growing pipe market – or

## FRANCHISING FACTORY

KWH Pipe Technology will supply a plastic-pipe factory to Lidco.

### Included in the supply are

- » factory planning
- » production line for 400–1,200 mm diameter polyethylene pressure pipes
- » production line for 400–2,200 mm diameter Weholite pipes and 10–400 mm diameter pressure pipes
- » cooling systems
- » machines for re-use of waste material
- » welding machines
- » machines for manufacture of pipe fittings
- » laboratory equipment for quality control

### In addition, included in the franchising agreement are

- » training for Lidco's personnel
- » technical support for production and sales
- » KWH Pipe and Weholite brands



more correctly for its lack of pipes. According to Kari Punnonen, the lack of building materials and builders in particular is slowing down the construction boom that is being fuelled at the same time by oil-industry revenues.

The development projects initiated in recent years have already attracted international companies to the country. Some of these arrivals have established joint ventures with local companies. Even so, some might still regard the KWH Pipe franchising project as a brave move. After all, the country is taking its first steps in the direction of the international market economy. "Our experience has shown that the system is working. Operations are proceeding as agreed in Libya, and the business is running smoothly", Punnonen explains. ■



# Potable water for Copenhagen

## Major by-pass operation for Copenhagen's water supply

**A**n extension to Scandic Hotel at Sydhavns Plads in Copenhagen, Denmark, forced engineers to find a way to carry out an unusually tricky operation. The task was to move the main water pipeline that supplies almost every tap in Copenhagen. Like in real-life critical surgery, there is no room for errors in an operation like this. If anything were to go wrong, it would affect the everyday life of a lot of people.

The reason for the demanding project was that the hotel is building a new conference wing on top of the pipes already installed, and therefore the planned pipe system had to be bent to make it go around the new wing.

### 30,000,000,000 litres of water

Copenhagen is supplied with drinking water from many different sources around the city

and throughout the Zealand region. Water is piped from each supply source to Copenhagen, where it is then transported through one large pipe which runs around the city. From here it is distributed throughout the supply network to the consumers.

This ring main carries something over 30,000,000 m<sup>3</sup> of water each year (equivalent to about 951 l/sec), and it is this part that needed to be re-laid. It was extremely important therefore that nothing would go wrong, as this would have disrupted the supply to all the supply mains feeding into the city.

Another main supply pipe runs parallel to the ring main at this point, and so the re-laying operation involves two major pipes with DN/OD 650 and 1,100 mm – the latter being one of the largest plastic pipes used in Denmark to supply drinking water.

In order to avoid any disruption in the wa-

ter supply, only one pipe at a time could be re-laid. The operation itself was not particularly difficult, but things were particularly interesting when the larger of the two pipes was being re-laid. As well as having to make a large bend around the new building, it also had to be laid beneath the other pipe and also beneath another existing sewage pipe with a diameter of DN/OD 800 mm – and all this in a very limited space.

### Cast iron and concrete to be replaced by plastic

The smaller of the existing pipes was made from cast iron and the larger of the two from concrete. Both of these were replaced by PE-HD pressure pipes supplied by KWH Pipe. KWH Pipe was also responsible for all welding operations and all other practical work involved in connecting the new pipes to the old ones.

KWH Pipe is the only manufacturer and supplier in Denmark that can supply PE pressure pipes of this size, and the company also has a mobile welding team that can provide on-site assistance with operations of this kind, as well as other operations.

Most of the welding and the rest of the preparation work was done “above ground”, after which the new section of pipeline preferably should be laid in one go and connected up to the rest of the pipe system.

At the start of the project, KWH Pipe’s Project Manager **Jan Lunding** said: “The biggest challenge will be to lead the 1,100 mm

diameter pipe under a sewage pipe. We will be trying to get the pipe down in one piece to avoid welding it, but since we’re working in a limited space, we still don’t know if it can be done”.

After running 3D simulations in order to explore the available options, KWH Pipe felt comfortable with this approach. The project was completed in April 2010, and KWH Pipe managed the challenge of installing the difficult part in one piece, saving both time and money for the customer. The project was a success, and the client, Københavns Energi, was very pleased with the result. ■



Re-laying Copenhagen’s main water pipe. Shown here is the large 1,100 mm diameter pipe being laid.

Once it is finally in place a bend will be put in, after which the pipe will be fed beneath the other supply pipe and an 800 mm diameter sewage pipe, before being connected to the original pipe.

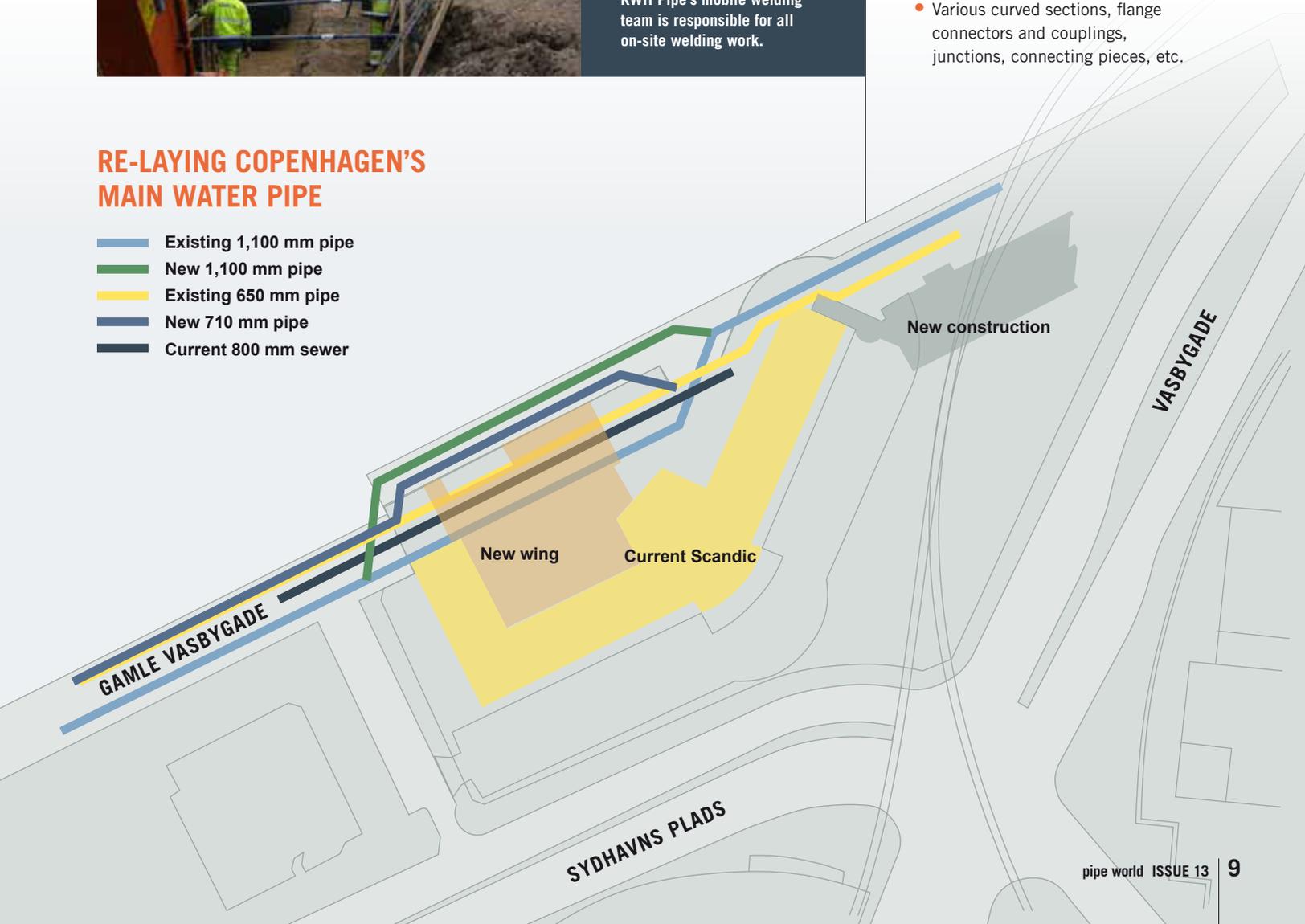
KWH Pipe’s mobile welding team is responsible for all on-site welding work.

## DETAILS

- » **CLIENT** Københavns Energi-Vand
- » **CONSULTANT** Grontmij/Carl Bro
- » **CONTRACTOR** Kamco A/S / KWH Pipe
- » **PROJECT**
  - 200 m of DN/OD 710 mm SDR11 PN16 PE100 pipe
  - 130 m of DN/OD 1,100 mm PN8 SDR21 PE100 pipe
  - Various curved sections, flange connectors and couplings, junctions, connecting pieces, etc.

## RE-LAYING COPENHAGEN’S MAIN WATER PIPE

- Existing 1,100 mm pipe
- New 1,100 mm pipe
- Existing 650 mm pipe
- New 710 mm pipe
- Current 800 mm sewer



# High cleaning

## Wastewater treatment on a mountain top

**On top of the Ramundberget mountain in Swedish Lapland, just above the tree limit, you will find Restaurant Tusen. Due to its remote location and focus on environmental conservation, the restaurant draws its water from wells drilled in the mountain and uses geothermal energy for heating. Wastewater handling has been solved by installing a WehoPuts treatment plant.**

**R**amundberget mountain is situated 700–1,000 metres above sea level, and is considered to be one of the most snow secure ski areas in Sweden.

At a distance, the structure in which the restaurant is located resembles a large *goah-ti*, a traditional building structure of the indigenous Sami people. The restaurant is situated between trees, brooks and rocks, blending into the environment. The location is such that it emphasizes the building's close relationship with nature, both in summer and in winter and gives a splendid view over the landscape. According to the architects Murman Arkitekter, who designed the restaurant, the aim was to create a structure that would be in harmony with the character of the landscape in shape, design and material, and be clearly visible from a distance, with an inviting entrance

area to the south. The ambition was that the interior should be both intimate and spacious as well as offering a magnificent view of the surrounding mountain peaks. Murman Arkitekter were awarded first prize in the holiday resort category at the World Architecture Festival in Barcelona 2009 for the design of the restaurant.

The location of the restaurant presented its own challenges. As the aim was to find an environmentally friendly option for the treatment of wastewater, several innovative solutions were considered. The owners, Ramundbergets Alpina AB, opted for installing a WehoPuts 70 bio-chemical domestic wastewater treatment system for year-round use. The WehoPuts treatment plant utilizes the Sequence Batch Reactor principle. This technology proved to be the option best suited for the project. Traditional infiltration of the wastewater was assessed

as unsuitable due to the ground conditions, with shallow layers of soil and high water table. Connection to the municipal sewage network would have involved a great deal of construction work, affecting the environment, and the cost would have been very high. The advantages of WehoPuts were clear: it was delivered ready to install from the factory and it blended well into the surroundings.

The WehoPuts plant treats and purifies wastewater from the restaurant according to set rules; organic substances, measured as BOD<sub>7</sub>, are reduced by at least 90% and total phosphorus is also reduced by at least 90%. It is dimensioned for a total load equivalent of 70 PE and has a cleaning capacity of 10.5 m<sup>3</sup>/day. During peak season it is estimated that a maximum of 300 people visit the restaurant daily. Each guest is estimated to contribute 30 litres of water, giving a flow of 9 m<sup>3</sup>/day. This means that the treatment plant is well dimensioned to handle all the wastewater produced

**WEHOPUTS WAS DELIVERED  
READY TO INSTALL FROM THE  
FACTORY AND IT BLENDED WELL  
INTO THE SURROUNDINGS.**

by the restaurant. The wastewater from the kitchen passes through a grease trap before entering the treatment plant in order to ensure that excess grease does not enter the plant.

The system consists of a tank for water flowing into the plant, a storage tank and process tanks where the wastewater is treated. The wastewater is treated and purified one batch at a time, which ensures that potential load variations do not influence the cleaning result. After the process tanks, there is a collector tank for the purified water, which is then pumped to a filter bed made of gravel for infiltration before being released into the environment. Sludge formed during the treatment process is pumped to a dewatering tank, which is emptied once a year.

The decision to use the WehoPuts wastewater treatment plant for cleaning the wastewater produced by Restaurant Tusen has proved well-founded. With its own well for water supply, geothermal energy for heating and a wastewater treatment plant in combination with an infiltration facility, Restaurant Tusen can truthfully claim that it has put the focus on minimizing environmental impacts. ■

# A treatment plant as a shared project

**A small treatment plant that is shared can provide a solution for wastewater treatment in a neighbourhood or a small town, once and for all. This has been noticed, for example, in Ostrobothnia, on the west coast of Finland.**

TEXT **Marianna Salin** » PHOTOS **Robert Lundqvist, Esa Melametsä** »

**T**he village of Skaftung is located in Kristinestad, in the southernmost coastal municipality of Ostrobothnia. It is inhabited by both farmers and fish farmers, and its isles and inlets also attract vacationers, bird watchers and Sunday fishermen.

On the western border of the village in a very close proximity to the sea, a small window and door factory, plies its trade. The owner, **Rune Lindberg**, is a native of Skaftung and a very active one, too.

In the autumn of 2009 he started finding out about the treatment of wastewater. At that time, a major part of wastewater drained through septic tanks into the ground and watercourses. The law required that the situation should change by the beginning of 2014. Lindberg gath-

ered the residents and vacationers of the neighbourhood together to brood over a possible solution.

"There are 44 houses, and they are quite close to each other. It was clear that a shared treatment plant would be more economical than having one for each of them."

## Carefully chosen

In the selection of a wastewater treatment system, both the soil as well as the location of buildings must be taken into account. Rune Lindberg, therefore, approached a designer already at an early stage.

A biochemical WehoPuts 100 treatment plant was chosen as the treatment plant. There are approximately 60 year-round residents in the area, so even a



## THERE IS STILL MUCH TO DO

In Finland there are approximately 350 000 properties in sparsely populated areas outside the sewer network. It is estimated that only 5–10 percent of these would have wastewater systems, as required by the Government Decree on Treating Wastewater in Areas Outside Sewer Networks. ■

smaller plant would have sufficed. Room for growth was left, for example, for a future fish processing plant.

In early summer, the village's own contractor dug a trench for the treatment plant, which was duly installed. Ahead, there is still some four kilometres of pipeline to dig.

Once the pipes are in the ground, the plant will be ready for use. Lindberg intends to contract a professional maintenance service.

Rune Lindberg makes the treatment plant project sound like a simple task. The project, however, involved 70 people, most of whom also participated in the discussion.

"I have acquired knowledge and shared it with others. People have placed their trust in the project, and there hasn't even been a need to vote about anything," says Lindberg.

He collected the money for the purchases from each participant, and, in future, water meters will provide information about each participant's share of operating costs. Financial management will be kept straight by a cooperative society which was established right at the beginning of the project. In addition, the state supported the project to the tune of € 25 000.

### Municipality helping the villagers

Also a village in the municipality of Pedersöre got its share of the state's water management grants for Ostrobothnia. The village, which has 22 houses, is located some way inland from the coast. The village's own water association has, already for a long time, been responsible for the supply of clean water. Each house has conducted its wastewater through septic tanks or wells to the ground.

The villagers knew that wastewater management needed to be addressed as soon as possible. The village is located, however, in the groundwater zone, for which reason separate treatment plants for each property could not even be considered. Admittedly, very few

would even have been interested in such a plan. For residents well over 70 years of age, a miniature treatment plant, even when shared, seemed an unnecessarily large project. Decisions were postponed.

"Eventually, we agreed that the municipality will assume the responsibility for the common treatment plant design and construction and will collect subscription fees from the residents in due time", explains **Stefan Hellund** who is the municipal Construction Engineer.

The biochemical WehoPuts 70 treatment plant was installed during the summer, and the pipelines will be dug in the autumn when the work in the fields is over. A total of four kilometres of sewage lines have been promised.

### Miniature treatment plants also for municipalities

According to Hellund, projects related to both wastewater treatment plants as well as connection sewers are constantly taking place in Pedersöre. More than half the population is currently connected to the municipal sewer system.

"The aim is to connect almost 80 houses a year into the sewerage system. There are nearly 500 houses which must decide about the matter by themselves"

Pedersöre municipality is responsible also for a residential area where wastewater from

14 houses has so far been purified by infiltration. Last year, however, the system that had served for 12 years started acting up.

"We could have perhaps replaced the system, but it would have been a big job", Hellund says.

A mini biochemical treatment plant was chosen as the new system. WehoPuts 70 met the criteria, including size.

### Clean water, clean nature

Contractor Stefan Snellman assumed the responsibility for digging work, and, as a dealer for WehoPuts, he also gave advice in the installation of the treatment plant.

"The place was the best possible, dry enough. It was easy to install", Snellman says. Pipelines left behind by the infiltration system were in readiness. The gravity sewer went so deep, though, that a decision was made to install a pumping station in front of the treatment plant.

Those few days of work were finished in early summer, and the treatment plant was immediately put to use. Snellman has kept an eye on the operations to ensure their smoothness during the initial stages. Good news welled up in an open ditch 50 metres from the treatment plant.

"Very clean water, indeed." ■





Underground fire protection pipe

# Only the best will do

**S**CG Chemicals, one of the largest chemical companies in Thailand and a subsidiary of Siam Cement Group, is known for its relentless commitment to quality and environmental management. Recently, together with joint venture partner Dow Chemical Company, it has expanded its operations, constructing the largest and most efficient chemical plant on the south-eastern shore of Thailand. Due to the requirement of adhering to strict international standards, especially in terms of safety, the project in Banchang, Rayong Province, became known among the engineers working for the construction firms as one of their most difficult assignments ever.

The requirements were equally strict regarding the underground fire protection pipe system needed for the plant. The project designer opted for high quality PE-HD pipe because of its durability, low friction property and long life span. The project consultant, MTP HPPO Manufacturing Company, and Foster Wheeler, whose scope of works includes engineering, procurement and construction management,

chose Wiik & Hoeglund, KWH Pipe's subsidiary in Thailand, as their supplier.

"We are very pleased and honoured that the customer chose us for this project," says **Nattharat Sai-Ngern**, Sales and Marketing Manager at Wiik & Hoeglund. "It is always satisfying to be awarded a prestigious contract, but

**THE NEW CHEMICAL PLANT IS STRIVING TO TAKE THAILAND'S POLYMER BUSINESS TO THE NEXT LEVEL.**

since the requirements were so strict, this feels like a fulfilment of our ambitions and recognition of our dedication to offering the best quality products and services".

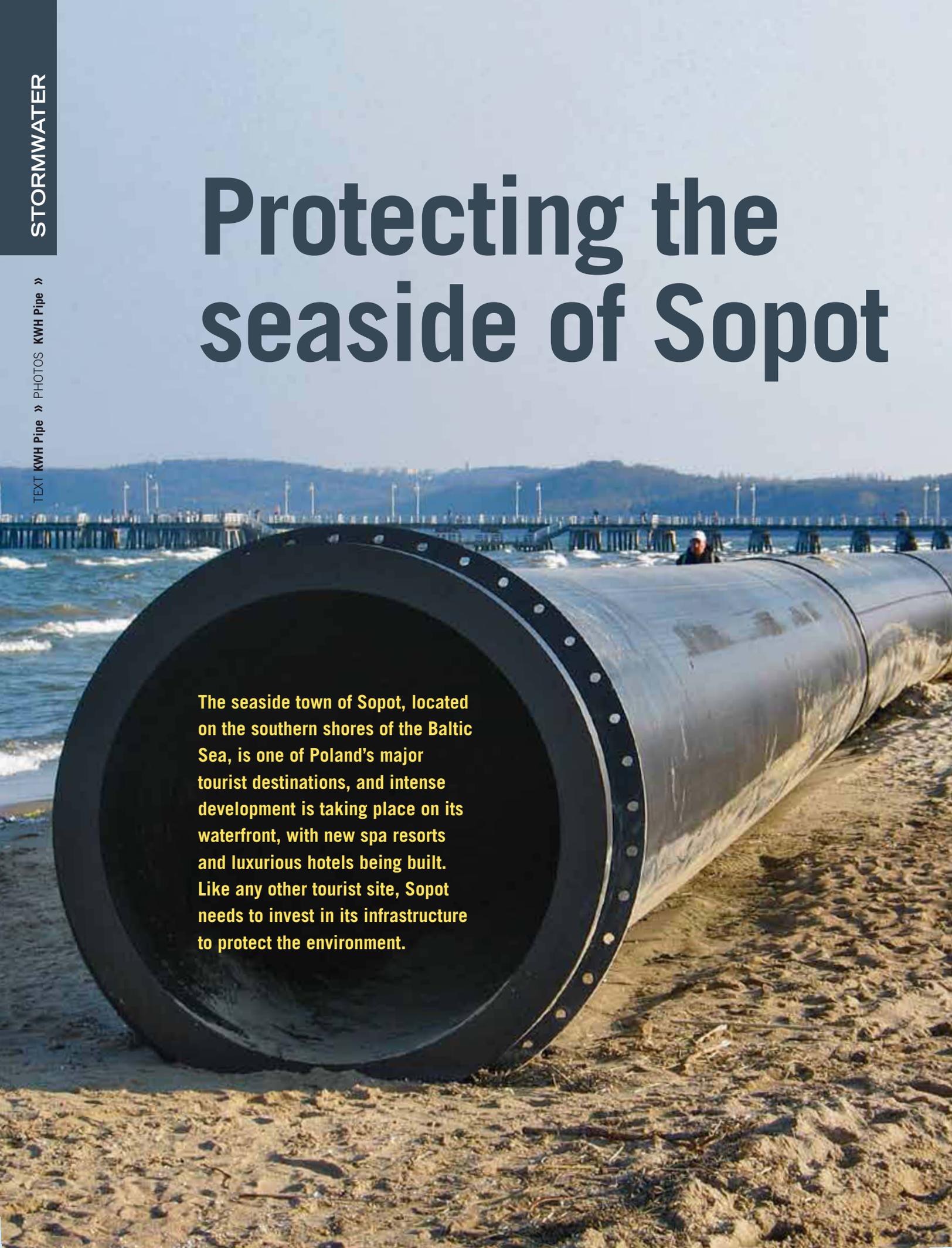
Before making a final decision to buy, the project group visited the factories of every potential supplier in Thailand in order to verify who could meet their high quality standards. Wiik & Hoeglund was the only supplier able

to provide the customer with pipes, fittings, welding and installation in line with the ASTM standards as a one-stop service.

Along the pipeline route there were height differences and several 90 degree bends that had to be taken into account. Thus the extensive know-how and experience of installation that Wiik & Hoeglund could provide was a key factor in the decision-making process.

The complete range needed for the factory area comprised 6, 8, 12, 16 and 24 inch pipes for a total length of 7,500 metres. In addition to choosing PE-HD, the designer also decided that bends and fittings were to be reinforced using GRP as a safety precaution, in order to accommodate the potentially very high pressures needed for the underground fire protection system. Installation was carried out professionally by Wiik & Hoeglund's subsidiary WH Pipe Thailand in accordance with the customer's high standard safety regulations. The project was completed in early 2010, and the brand new chemical plant has since then been taken into operation and is striving to take Thailand's polymer business to the next level. ■

# Protecting the seaside of Sopot

A large, black, cylindrical pipe is lying on a sandy beach. The pipe is the central focus of the image, extending from the foreground towards the background. In the background, there is a pier with many white masts or poles extending into the sea. The sky is clear and blue. The overall scene is a coastal setting.

The seaside town of Sopot, located on the southern shores of the Baltic Sea, is one of Poland's major tourist destinations, and intense development is taking place on its waterfront, with new spa resorts and luxurious hotels being built. Like any other tourist site, Sopot needs to invest in its infrastructure to protect the environment.



**T**he health-spa and bathing resort Sopot has attracted visitors ever since its first spa opened in the 16th century. The rich and the famous soon followed, starting to build mansions in the town, which still has the highest property prices in Poland, apart from the capital Warsaw.

Intense development is currently taking place on the waterfront, with new spa resorts and luxurious hotels being built. In the Sopot area, there are eleven small streams, which have a total length of 21 kilometres and incorporate seventeen ponds. Their estuary sections are made of concrete canals (Ø 1,000), which have their outlets on the beach. The existing stormwater drainage system is connected with the streams flowing through the city. When it is raining, stormwaters wash out waste and pollutants from the Sopot area and discharge them directly to the Baltic Sea, resulting in an occasional failure to meet the standards for bathing water quality. This leads to a temporary closure of public swimming and recreational areas, which in turn has a negative impact on the value and reputation of Sopot as a health and seaside resort.

Another major frustration is the flooding of the streets and buildings in the lower part of the city. This is due to the insufficient capacity of stormwater interceptors and collecting pipes and the fact that there are not enough retention tanks and reservoirs alleviating the stormwater drainage system during flash storms.

### **Protecting inhabitants and tourists**

A project to direct Sopot area stream waters further out to the Gdańsk Bay has been initiated. It is one of the many environmental projects that have been carried out in Poland in recent years. Like in other projects aiming to make local water and sewer systems comply with strict EU standards, the success of this project depended heavily on the quality of the materials used, as well as cost savings and quick completion. The use of WehoPipe PE-HD pipes made it possible to meet all these requirements.

Construction of a marine outfall is the first and the most important stage of a large project called "Protection of Gdańsk Bay waters – construction and modernisation of the stormwater drainage system in Sopot". The main aim of the project, which is worth EUR 18 million and is 20% co-financed by the European Union's Cohesion Fund and 80% by local funds, is to protect

homes in the lower part of Sopot against flooding. Another goal is to improve water quality and clarity in the city's public swimming and recreational areas.

The project involves increases in the total capacity of canals used for draining stream waters in urban areas, the construction of retention tanks and reservoirs in selected watercourses, the modernization of existing tanks and reservoirs, as well as the installation of sedimentation tanks and separators at stormwater inlets of the streams. These measures are also necessary because in 2015 an EU directive concerning the management of bathing water quality will enter into force, tightening the standards for water quality in public swimming and recreational areas. The discharge of stormwater further out to sea is estimated to decrease the

influence of the streams on the quality of coastal waters to one hundredth of the present figure.

Three separate collecting systems will be built for Sopot streams and three double-pipe discharge pipelines will

be installed deep into the Gdańsk Bay, 345–375 metres away from the outfalls located on the beach. In the first phase of the project, two outfall systems – conveying water from six streams – will be constructed, while the second phase – planned for the coming years – will involve the building of pipe systems for the remaining streams. The contractor – a consortium of two companies: Hydrobudowa S.A. Gdańsk and PRCIP Sp. z o.o. Gdańsk – was selected by tender, while KWH Pipe Poland was chosen as the supplier of piping solutions for both outfall systems.

PE-HD WehoPipe (DN/OD 1,600 mm PN6 SDR26) pipes were used for the discharge pipelines and WehoPipe pipes (DN/OD 1,200–1,600) for the land section of the pipeline. KWH Pipe also supplied a wide range of non-standard inspection chambers, sedimentation chambers and special fittings. The contract also obliged the company to provide welding machines and installation crew, who made most of the joints.

### **Excellent properties of PE pipes**

Polyethylene pipes are flexible, which makes them easily adaptable to various soil conditions and more resistant to vibration, loads and soil movements. Due to their low weight, PE pipes are easy and quick to install. They can be manufactured in considerably longer lengths than traditional pipes, which significantly shortens

**THE SUCCESS OF THIS PROJECT DEPENDED HEAVILY ON THE QUALITY OF THE MATERIALS USED.**



Tugboats transported the whole pipeline to its destination, where it was sunk in a carefully selected place.

the installation time. What's more, polyethylene pipes have superior chemical and corrosion resistance, which is a key factor when it comes to applications in salt water. PE-HD pipes are thus the perfect solution for marine projects.

### Starting with the land section

The pipes were manufactured in the KWH Pipe factory in Kleszczów near Bełchatów, transported to Sopot in 15-metre segments and joined by butt welding on the beach. The several tens of metres long welded and ready-to-install segments were then moved to the construction site and lowered into trenches by pipe layers equipped with lifting slings. In the trenches, individual segments were connected using flange joints.

The pipeline project also included inspection and sedimentation chambers, which were made – as prefabricated components – of pressure pipes with eccentric manhole risers (inspection chambers) or symmetrical ones with straight stubs (sedimentation chambers). They are equipped with hermetic polyethylene hatches of 800 mm in diameter, which are installed by means of flange joints secured with screws. The hatches were installed 80 cm below beach level.

### Smooth connection of the land and marine sections

The discharge pipelines – two of which are 345 metres long and two 375 metres long (DN/OD 1,600 mm) were butt welded directly alongside the river Martwa Wisła (Dead Vistula), 15 kilometres away from the construction site. The pipelines were then fitted with end closures, ballasted with reinforced

concrete weights and towed by tugboats to Gdańsk Bay. Trenches had been dug in the Gdańsk Bay and water was pumped into the pipelines so that they could be sunk. "It's a very complicated and precise operation", said **Elżbieta Turowiecka**, the Head of the Department of Engineering and Environmental Protection at Sopot City Hall. "We'd been

**IT IS ABSOLUTELY ESSENTIAL THAT EACH PHASE CAN BE CARRIED OUT QUICKLY, SMOOTHLY AND WITH REASONABLE DISTRIBUTION OF FUNDS.**

waiting for appropriate weather conditions, one of which was a calm sea, so that tugboats from the port could safely transport the whole pipeline to its destination, where it was sunk in a carefully selected place."

The operation was monitored by divers. The last installation phase involved the connection of land and marine sections in which the marine and land pipelines installed on the beach were joined with outlet chambers and receiving tanks. Even though weather conditions were occasionally unfavourable, the whole operation went without hitches. The first phase of the project was finished in December 2009, roughly 12 months after the work had started.

### Environmental protection

Environmentally friendly water and sewage management projects such as this are usually very complex, multi-stage ventures requiring enormous financial expenditure. It is therefore absolutely essential that each particular phase can be carried out quickly, smoothly and with reasonable and justified distribution of funds. The use of WehoPipe PE-HD pipes in this project made it possible to meet these requirements.

What's more, the advantages of polyethylene pipes, such as durability, a long lifespan, the tightness of joints and superior chemical resistance, contributed to the realization of the main project objectives: improvement of the water quality of public swimming and recreational areas and beaches in Sopot, as well as an increase in the level of environmental protection in the region. ■



# Large Weholite pipes will help to cut pollution in Birmingham

**Severn Trent Water is using one of the largest plastic pipes available on the market to help reduce pollution as part of a sewer improvement project in south Birmingham, UK.**

**W**ater company Severn Trent, in consultation with Barhale Construction plc, has chosen Weholite PE-HD pipe, recognised for its light weight and durability, to reduce the risk of pollution to the River Rea. The pipes are manufactured by Asset International Ltd, KWH Pipe's Weholite licensee in the UK.

The large-scale project will upgrade the existing sewerage system through Cannon Hill Park near Edgbaston, Birmingham. This will include improving its resilience in storm conditions by rebuilding an overflow chamber and adding a storage tank, which in turn will reduce the amount of overspill into the river during storm conditions and improve the water quality of the River Rea.

500 metres of DN/ID 3.5 metre diameter Weholite pipe will be laid in 47 metre long rows interconnected by nine manifold sections to form a storage tank during periods of bad weather. The end pipe will act as the

primary entry point for the water. The inlet will then release the water into eight adjacent pipelines. The tank incorporates a sewage pumping station to return flows into the sewerage system.

Severn Trent's original design considered using a concrete specification for the new storage chamber. However, due to cost and the length of time this would take to construct, the company looked for an alternative material. By using Weholite instead of concrete, the project saved 2,600 tonnes of CO<sub>2</sub> when the overall process, including manufacture, transportation and the laying of the pipes, is considered – helping to contribute to Severn Trent's carbon reduction targets.

Contractors Barhale will be laying the pipes for Severn Trent. Barhale Site Manager, **Roger Light**, said: "Weholite pipes are lightweight and therefore easy to lay. By using plastic rather than the original concrete specification we'll be able to reduce the time spent on site by six months."

"Also a number of health and safety issues are removed for us as there is much less need for heavy-lifting machinery on site for installation."

Project Coordinator for Severn Trent Water, **Wayne Ellis**, said: "Our sewerage system through Cannon Hill Park has been serving the community for many years. However, it is no longer able to cope with modern demands.

"During heavy rainstorms an overflow of sewage and rainwater spills into the River Rea and causes pollution. We want to reduce these occurrences and we are committed to helping clean up the river by reducing pollution from our sewers."

Managing Director at Asset, **Simon Thomas**, said: "We have successfully worked with Severn Trent on many projects, all of which have used our Weholite pipes. This project was the largest order to date for our new 3.5 metre diameter pipe and in total there will be 34 sections of pipe, all of which will be welded on site, used in the project. Weholite is very versatile and particularly effective for projects of this nature because the pipes are prefabricated and lightweight, which means they can be quickly and easily laid on site." ■



Weholite facilitates

# Canadian hydropower project

**Hydroelectricity has been used in Canada for more than 100 years and today represents two-thirds of the country's power generation. While hydroelectric power is not a new concept, using large-diameter high-density polyethylene pipe to transport water from a source to the generator is relatively new and is helping increase efficiency standards in construction and operation.**

**A**t the Wawaitin Generating Station on Kenogamissi Lake located near Timmins, Ontario, OPG (Ontario Power Generation) is conducting a total reconstruction of its hydroelectric plant including the piping system responsible for transporting approximately 40 cubic metres per second through the plant which generates 10 MW of electricity. Including the Wawaitin Generating Station, OPG has a total capacity of more than 21,000 MW, making it one of the largest power generation companies in North America. The entire Wawaitin GS is being rebuilt for it is at the end of its service life. The new plant will generate 15 MW of electricity, which is enough to power approximately 15,000 households.

The original piping system at the Wawaitin GS site utilized different types of traditional materials, including wood stave and steel. Several different materials for the large diameter pipe were considered to transport wa-

ter from the Kenogamissi Lake to the plant.

The original design was based on using concrete pipe with a transition to steel to accommodate the higher head pressure closer to the powerhouse. However, cast-in-place concrete requires a lot of man hours to install, can be expensive to maintain and repair, and the rebar used in construction can corrode and cause other problems. With this in mind, KAP (Kiewit-Alarie, A Partnership) made the decision to change the original design to replace the concrete portion with a PE-HD pipe. The specific pipe chosen was KWH Pipe's Weholite, which Kiewit has used before on other hydropower projects in British Columbia.

### Easy installation

Weholite is a large-diameter, structured-wall piping product for gravity applications, that can be custom-manufactured for low-pressure applications. The pipe combines the raw

material properties of PE-HD with structured-wall technology to create a lightweight engineered pipe with excellent loading capacity. It offers properties such as stress-crack resistance, salt water and chemical resistance, cold temperature toughness and the ability to create a leak-free piping system through extrusion welded joints. The pipe can be produced in dimensions up to 132 inches (3.4 metres) making it possible to convey large volumes of water. Pipe lengths are practically only limited by what can be transported by truck.

Weholite has been used in many municipal and industrial applications, including new pipeline and pipeline rehabilitation projects, and offers substantial savings in weight for increased ease of installation and cost effectiveness. This was a key factor in KAP's decision to include approximately 3,100 feet (945 metres) of 132 inch (3.4 metres) DN/ID Weholite pipe in two parallel lines, according to **Paul Mongelli**, Site Engineer with Kiewit at the Wawaitin Generating Station Project.

### Less man hours and equipment

"This is our first design-build project with OPG," says Mongelli. "We did our homework and decided against using concrete due to several construction and operational benefits of PE-HD. The Weholite pipe can be installed in less man hours and with less equipment so there were significant cost savings during construction. It also offers OPG some nice benefits once the plant is up and running."

"The ability to extrusion weld joints is a tremendous benefit of PE-HD pipe," adds Mong-



elli. "We can typically weld one to two joints per day, resulting in a much improved timeline for this part of the project. And there are no building forms, pouring concrete or drying time. The ability to extrusion-weld the joints greatly reduced the time and manpower needed for the project." Extrusion-welded joints create a leak-free, self-restraint, monolithic pipe structure; the welded joint will also eliminate infiltration into the pipe and exfiltration into the environment. Maintenance benefits also made PE-HD a solid fit for the Wawaitin Generation Station.

**Bruce McIvor**, Site Representative with OPG says, "We anticipate zero maintenance costs with the PE-HD pipe. Concrete can be expensive to maintain due to rebar corrosion and it's not as smooth as PE-HD pipe. It also

doesn't corrode like steel pipe. This site has been in operation since 1912 so we've seen a little of everything here. We will have a maintenance program in place for the new system, but we're not planning to have to do much with the Weholite pipe for a long time."

“ WE ANTICIPATE ZERO MAINTENANCE COSTS WITH THE PE-HD PIPE. ”

### Reducing carbon footprint

In addition to the facility coming to the end of its service life, OPG is replacing the generating station because of an 18% energy loss with the system due to the 300 km of transmission lines the power must travel to get to the grid. "The new system will change the generating station from 25 to 60 Hz allowing connection directly to the local distribution system, eliminating the need to transmit the energy from Timmins to Sudbury. This change will eliminate significant energy losses and free up a transmission corridor," says McIvor.

"By refurbishing, upgrading and expanding our hydroelectric capacity across the province, we are diminishing our reliance on burning coal for fuel and plan to stop burning coal altogether by the end of 2014. OPG is committed to reducing its carbon footprint through projects like this one and enjoy the opportunity to work with companies like KWH Pipe and Dow which have similar corporate goals," adds McIvor. ■



**W**hether it concerns a mine tailings line north of the Arctic circle, a marine outfall for a power plant in the Mediterranean, water storage tanks for a steel producer in Asia or penstock lines for a hydropower project in North America, or anything else that improves an industrial process, there is a good chance that KWH Pipe has already done it.

Where other pipe manufacturers lack the right product, knowledge about its performance or installation capabilities, KWH Pipe is up to the task. “That’s why we call ourselves pipe systems provider, instead of pipe manufacturer,” says **Stefan Gros**, Executive VP of Product and Production Development.

Gros continues: “For a pipe systems provider like KWH Pipe, the interaction with industrial customers is very rewarding. They ask us to come up with new ways to fix

their problems. Other times, we approach customers with a new product. At first they might claim that their current product works just fine, but when we start asking questions about downtime, maintenance and installation, and explain how our solution works, it makes them think. At that time when they start analysing the costs, they realize just how much money KWH Pipe can save them.”

During the last few years, KWH Pipe has worked on developing its range of Functional Piping Solutions (FPS). These products all have some things in common: a multilayer structure, a narrow focus on solving a particular problem and the possibility to customize a solution especially for the conditions of a specific project. Gros explains: “We have researched which polymers are especially resistant to, for example, abrasion or certain chemicals. Sometimes it’s possible to produce a pipe entirely from those materials, but as these are specialty polymers it would be very cost-

## Multilayer solutions can save millions

**WehoSlurry** is a complete system for transportation of abrasive sludge, slurry and dry materials. This highly wear-resistant piping system can be used, for example, in the mining industry, as feed lines for fish farms, or in the paper and pulp industry. In these applications and many others, the medium transported in the pipe contains particles so hard and sharp that they quickly erode most types of pipes from the inside out. The downtime from replacing the pipes can have a significant negative impact on the bottom line of an industrial operation. Therefore, a piping system that has a significantly longer service life has been desired by many maintenance engineers worldwide.

**WehoChem** is a piping system especially developed for transportation of highly aggressive process chemicals and has proven itself by transporting 93% sulphuric acid for a processing plant. The polyethylene pipe is equipped with an inner layer that is customized for the chemicals to be transported. In comparison with PVDF or acid-proof steel pipes, they are a very cost-efficient alternative. Handling is facilitated by their light weight, and installation is quick and simple as smaller dimensions are delivered in long lengths on pipe reels. Storage tanks can also be equipped with specific chemical-resistant properties.

ly. Therefore, in our FPS products, most of the pipe wall is made up of polyethylene, and the functional polymer layer is just as thick as it needs to be. It's cost-efficient and the polyethylene gives the pipe structural strength, flexibility, light weight and corrosion resistance."

Sometimes, metal pipes are claimed to be abrasion-resistant, being produced from a harder material than the abrasive particles.

However, a hard material like metal is also brittle, and even though the pipe would withstand the wear from the inside, it might be too brittle to handle stress from pressure surges or ground movements and would consequently break. The WehoSlurry pipe is designed to absorb this type of stress and offer optimal durability by combining the flexibility and corrosion resistance of polyethylene with an extremely wear-resistant inner layer. Also, instead of being hard, the inner polymer layer is soft since abrasion tests in laboratory as well as full-scale tests clearly indicate less wear for softer materials in most cases. This is how KWH Pipe can prolong the life span of a piping system using functional polymer layers. ■



**WehoAntistatic** is an electrically conductive pipe system for conveying flammable substances in gaseous, liquid or solid form. Examples of such substances are industrial effluent containing landfill gas, industrial raw materials, dust, flour and wooden pellets. Static electricity build-up in a piping system can create sparks that ignite the substances and lead to fires or explosions. Static electricity also makes the pipe surface attract dust or other small, dry particles, which can be a problem in some processes. Metal pipes have traditionally been used for the purpose, but since they are prone to corrosion, WehoAntistatic has offered industrial customers an interesting alternative. There are also tanks utilizing multilayer technology for storage of the same type of materials.

## Russian miners worn out by abrasion

**Wear-resistance was not the only benefit of the WehoSlurry piping system in Karelsky Okatysh, the most modern iron ore mining complex in Russia.**

**O**n the very border of Finland and on the bank of Lake Kontokki lies the town of Kostomuksha – one of the youngest towns in Russia. It was founded not more than 30 years ago, as the construction of the iron ore mining and concentration complex today known as Karelsky Okatysh (Karelian Pellet) started. Today, this subsidiary of the Russian steel giant Severstal can produce 10 million tonnes of iron ore pellets per year, which is about a third of the total production in Russia and 40% of the exports. Karelsky Okatysh is the most modern iron ore mining complex in Russia, but nevertheless it faces a problem common to many other mines around the world.

One of the fundamental stages during the production of iron ore pellets is concentration. In the crushing and preparation plant, crushed ore is mixed with water into a slurry and then transported in pipelines to hydrocyclones where valuable minerals are separated from waste gangue. The slurry, with its average density of 1,300 kg/m<sup>3</sup> and size of the inner fractions up to 0.8 mm, is not just any high-viscosity mass. Therefore, it is understandable that the pipe used for transportation of the slurry has to be highly resistant to wear, especially in places where the slurry flow



speed is the highest, as in bends, branches and fittings for pumps. Until last year, the company has been using steel alloy pipes, even though the steel pipes have not been able to withstand the aggressive wear, requiring frequent maintenance.

Steel pipes are popular in Russia, as they can be installed by normal welding, but in this case the steel pipes were simply not wear-resistant enough. "We are forced to repair the pipes every six months by changing entire pipeline sections", the plant workers say. "This is very costly for us", they continue.

The fact that polyethylene pipes are successfully replacing ordinary steel pipes in many applications has been known for a long time. In Russia, however, polyethylene pipes have until recently been used mainly for water and sewage pipelines. Fortunately, in 2009, the plant management of Karelsky Okatysh learned about a new and innovative technology – WehoSlurry from KWH Pipe. The multilayer piping system has a polyethylene outer layer providing structural strength and an inner layer of an extra abrasion-resistant polymer material. This structure makes the piping system flexible, lightweight and highly resistant to abrasion, corrosion and impact. These are properties unmatched by other materials.

As the plant management wanted to conduct a trial, it was decided that a 50 metre steel pipe slurry line would be replaced with the WehoSlurry system from KWH Pipe.

**NO CHANGES IN THE CONDITION OF THE PIPE HAS OCCURED EVEN AT THE MOST EXPOSED SECTION.**

On 7th of April 2009, the pipeline section was taken into use and has been subjected to monitoring on a regular basis. The latest inspection of the internal surface of the pipe was carried out exactly 10 months later, on 7th of February 2010. As it can be seen from the official record of the inspection made after 6,908 hours of continuous operational time, no visible signs of erosion of the inner layer were detected. Additionally, no changes in the condition of the pipe had occurred even at the most exposed section immediately after the slurry pump.

**Vladimir Ivannikov**, the head of the ore concentration department of the crushing and processing plant tells that at the moment the operational time of the section equipped with the pipes from KWH Pipe is more than 8,000 hours. Still no changes indicating abrasion of the surface have been detected. During the same time period, two sets of steel pipes have been completely replaced in other sections of the slurry line. According to the inspection record, the estimated operational time for the trial pipeline is going to be 5 to 10 years compared to the six months replacement intervals for steel pipe.

There is no need to mention the economic benefit, because it is evident.

Wear-resistance was not the only benefit of WehoSlurry in this project. The light weight and flexibility considerably facilitated the installation process as the DN/OD 355 mm pipes had to be brought through different obstacles, such as grates and wall sleeves. The pipe system offers several different jointing methods, each with their own advantages but all developed to ensure optimal performance even at harsh abrasive conditions. In this project, flange joints were found most suitable. Other methods available include butt fusion welding, electrofusion and mechanical couplings.

A formal decision is yet to be made, but already after ten months of testing, the workers at the department where the WehoSlurry pipes were installed are of the opinion that the same pipes should be used not only in all pipelines in the crushing and preparation plant, but in all parts of the Karelsky Okatysh plant.

Taking into consideration that the pipe can be in use for five years or more, even when being in contact with such a strong abrasive as this particular slurry, the maintenance-free lifetime of the pipes in sections with less mass and lower flow speed would be decades. This means savings in material and maintenance labour hours, and reduction of downtime, directly affecting the bottom line of any mining operation. ■





# Flexibility and good cooperation solve all problems!

**A** rainfall of 115 mm during a 24-hour period – that was one of the reasons why the Municipality of Burlöv, Sweden, made the decision to improve stormwater management on the outskirts of Åkarp. The pouring rain on 5th July 2007 created major problems, due to flooding, for the residents of the area. The municipal authorities carried out an extensive analysis of the sewer network and concluded that the existing network needed to be upgraded.

The new 700 metre long pipe system was dimensioned to alleviate the strain on the existing network, but also to take care of sanitary wastewater and stormwater from a new residential area under planning. Instead of the concrete pipes initially specified for the project, the contractor, Skanska, and the project owner decided to use Weholite PE-HD pipe, because it could be supplied in 18 metre lengths, allowing much quicker installation than when using concrete pipes. Other benefits of PE-HD pipes include easier handling, which also speeds up installation, and the fact that they last considerably longer than concrete pipes.

**THE PROJECT WAS CHALLENGING: IT WAS SOON CLEAR THAT REALITY DID NOT AGREE WITH THE RESULTS OF THE GEOTECHNICAL SURVEY.**

The pipes for this project were DN/ID 800 mm and 500 mm, supplied in 6 and 12 metre lengths. In addition to straight pipes, the delivery included bends and inspection chambers. Weholite can be joined together in several different ways, but for this application it was decided that socket joints would be the best option. As a new and improved socket joint system had been launched by KWH Pipe only recently, this was the first time it was used in an actual project.

## Good cooperation in a challenging project

In February 2010 when groundwork began, it was soon clear that reality did not agree with the results of the geotechnical survey. Higher water table than expected meant that the conditions for the project had changed dramati-

cally. In order to gain time for re-designing parts of the project and to make sure that it could be carried out according to the Swedish Work Environment Authority's regulations, the laying of the pipe was divided into three phases. Normally, the contractor starts construction at the outfall where the pipeline is at its lowest point, but this time the middle section was installed first. This way, the contractor was able to quickly start construction and avoid major delays.

The initial project plan of using 18 metre lengths had to be scrapped, but installers were at least pleased to see that the new Weholite socket joints performed according to expectations. Even though the pipes were supplied in 6 and 12 metre lengths, the installation went quickly and smoothly.

The conclusion of the project was that most unexpected problems can be solved with flexibility and a close cooperation with the project owner. "We made a number of major changes during the course of the project and the contractor has handled them well", says **Seid Kabil**, engineer at the Municipality of Burlöv. "I think our cooperation has been excellent", he continues. ■

# We cannot stop the rain but we can help avoid floods



6 x 36 m of DN/ID 2,400 mm Weholite pipe, capacity 977 m<sup>3</sup>



The heavy rainfalls of recent years have shown that the sewer network cannot always cope with large amounts of rain in a short space of time, resulting in flooded roads, cellars and drains. Since, by all indications, this type of weather will continue to become more frequent, we are stuck with a recurring problem unless something is done.

A sewer overflow system substantially reduces the risk of rainwater flooding. We have expertise in both manufacturing and installing these systems in all sizes. Contact KWH Pipe for a no obligation chat to discuss your options, including pipes for new sewers or sewer renovations.

