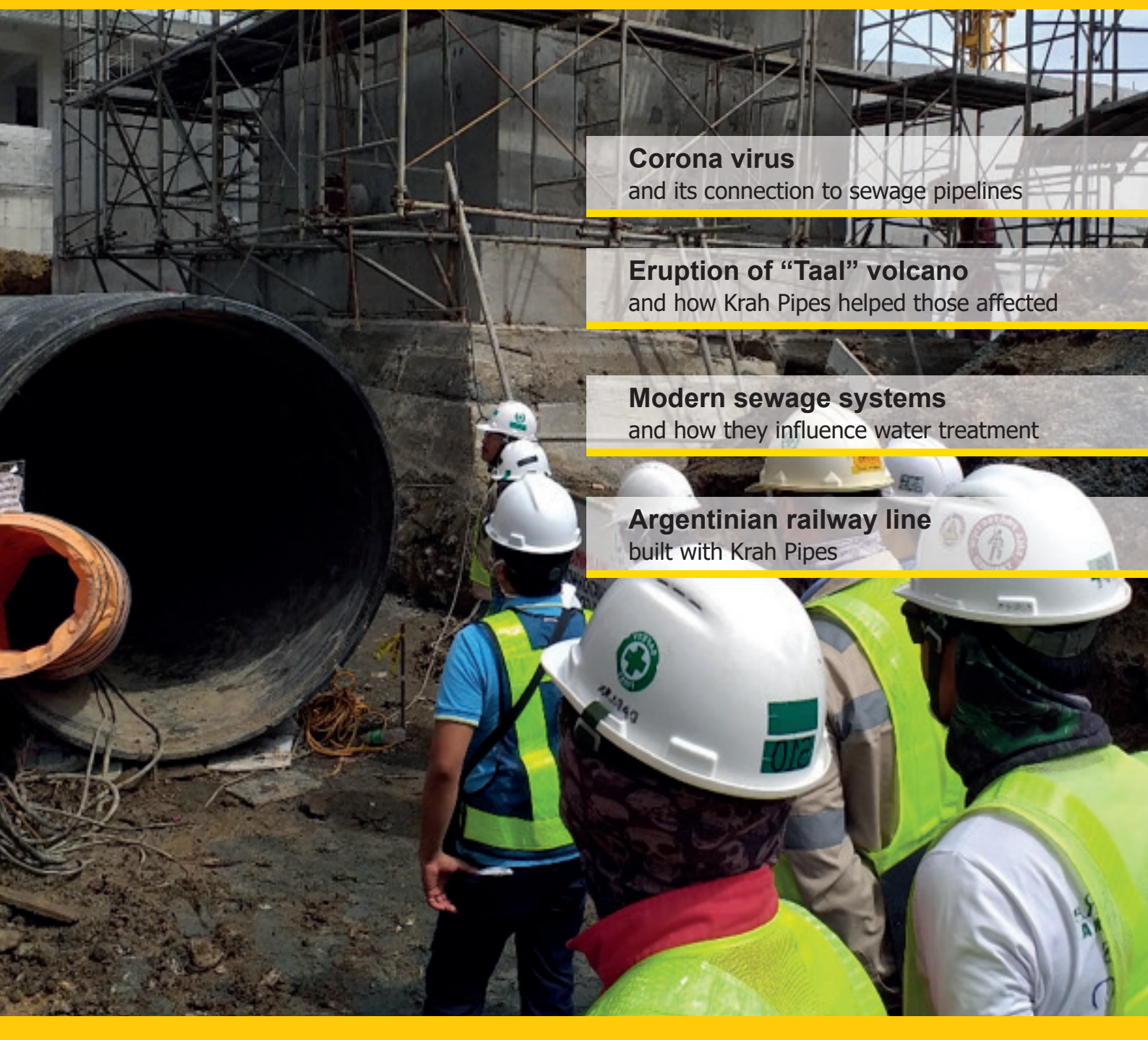


IMPROFIL



Corona virus
and its connection to sewage pipelines

Eruption of “Taal” volcano
and how Krah Pipes helped those affected

Modern sewage systems
and how they influence water treatment

Argentinian railway line
built with Krah Pipes

1. Intro	3
2. La Mesa water treatment plant Krah Pipes Manila, Inc.	4
3. How the eruption of the volcano "Taal" affected Krah Pipes workers	8
4. Tsunami shelter made out of Krah pipes	13
5. Modern and sustainable sewage systems	14
6. Belgrano Cargas: A key project to transport crops	18
7. How Krah sewage pipes can reduce the spreading of diseases	20

the first weeks of 2020 have already passed again – time to reflect on 2019 and also take a look into the things that will happen this year. We finished the last year with our annual company Christmas party which was legendary as always – good food, great atmosphere and lots of fun are the words to describe the party the best. Later on, we went to my new bar 3Skulls (you'll find the QR code to the bar's Instagram page below) where we spent the rest of the night singing, dancing and partying.



The Christmas party showed what 2019 was like for Krah – successful! 2020 will bring on some challenges for us – we already have many orders for new machines. Furthermore, we will invest in new production machines in our headquarter in Schutzbach, Germany to be state of the art and to keep producing in highest quality and precision. The new year will also bring on some new innovations which I cannot talk about yet – stay tuned! Another positive challenge for us this year is the IFAT in Munich, which (sadly) was postponed due to the Corona virus. The new date is from 07 - 11 September . We would be happy to show you our new booth in hall 3, stall 411 - hope to see you all there and have a great time!

On the other hand, the year hasn't started so positively for everyone. In the Philippines, the volcano "Taal" erupted again for the first time after almost 40 years and spit ashes and lava for days. Luckily, the region around Taal could be evacuated

quickly and those affected were immediately brought to evacuation shelters and care centers. Also, two members of Krah Pipes Manila were affected and had to leave their homes. An extensive interview with them can be found on page 8. Shortly after the eruption I flew to the Philippines to check out the situation myself.

Many people couldn't leave their houses because the evacuation centers were closed since there were too many people. Other natural disasters are also likely

to increase in the coming years due to climate change, and we should be as well prepared as possible. Japan has shown us with a tsunami shelter made of Krah pipes how such preparation could work. The shelter has room for 20 people and can save lives in the case of a disaster. You can find more information on the page 13. Furthermore, since the end of December 2019 the Corona virus "COVID-19" is threatening the whole world. Hundreds of thousands of people are either infected or directly affected by the infection of a relative. We are hoping that all readers of our ImProfil magazine and their families stay safe and healthy - read more of the connection between diseases and sewage systems on page 20.

So every year we face new challenges, that's why we have to stay together – for a good 2020!

Alexander Krah 



cility supplies 2400 million liters per day (MLD) potable water for approximately nine million Maynilad customers.

August 29, 2017 | Lamesa Water Treatment plant is being improved and West Zone Concessionaire Maynilad Water Services, Inc. (Maynilad) is willing to spend P7 billion for its modernization. The Fa-

The Improvement covers the enhancing of the rehabilitation of structures to improve earthquake resiliency, facilities' treatment capacity and automation of

process for a more efficient and reliable operations.

"Investment in additional treatment technologies is necessary given the dramatic shifts in raw water quality brought on by climate change. With this upgrade, water service to our customers will no longer be affected whenever turbidity level in the raw water increases," said Chief Operating Officer Randolph T. Estrellado.

Krah Pipes Manila, Inc. was privileged to be part of one of the largest water treatment facilities in the Philippines. Together with Sta. Clara International Corporation, Krah Pipes Manila Inc. supplied HDPE pipes needed for Maynilad's enormous facility.

The original material DI pipes to be used for the backwash lines were replaced by Krah HDPE pipes and fittings. Installation conditions were 8m depth of sludge as the backwash line will pass through an existing lagoon used for water treatment facility. Pipes will be fully submerged (prone to flooding) during rainy seasons and will be on top of a road passed by heavy equipment during construction and rehabilitation.





The pipe laying and jointing has to be fast and efficient as the sludge formation are unstable and prone to collapse.

With the Krah Pipes technology, transitioning the pipeline from 1800mm DI material to 1800mm HDPE was made easy by KRAH Pipes as the HDPE 6-meter flange-end pipe was pre-fabricated from Krah Plant and is ready to connect upon delivery. Seismic couplers were removed from the picture as the pipes are already flexible enough to withstand earth movements. Another cost saving with Krah pipes!

The backwash line includes 48pcs of 6m lengths 1800mm load bearing pipes, 4 pcs 1800mm custom length 45-degree bends, 2 pieces 1800mm modified flanged-end pipes and 3 pieces of special length pipes accurate up to the nearest millimeter.

The Sludge line requires many tailor-made fittings as the area has a very tight work-





ing space. Heavy equipment will not be able to access these areas thus, Krah pipes were the best choice for Maynilad's rehabilitation of these smaller pipeline. Pipes are lightweight and don't require large equipment to fit it up.

Even the smaller 400mm HDPE sludge lines can be easily transitioned to DI material with the use of Krah's flanged-end special length pipes. The 90-degree Krah bend was able to connect even with the tightest turns. Every joint was tested by Sta. Clara International Corporation joint-

ed with ARUP and passed without doubt. Sand bedding is used as backfill materials to protect the pipe's integrity during ground movement and to avoid any objects detrimental to the pipe. Thrust blocks were also installed for every turn to protect the alignment of the pipes against internal movements.

to the supernatant tanks as the hubs were misaligned and DI pipes are rigid all throughout. With extensive engineering, Krah Pipes was able to produce a pressure pipe especially bent as the site requires double end flange. The pipes were delivered pre-fabricated from the plant and was a perfect fit without problems.

There has been an error during the installation of 400mm DI pipes. The flange of the existing material could not connect

: Krah Pipes Manila



IFAT 2020 -



World's Leading Trade Fair for Water, Sewage, Waste and Raw Materials Management

07.09. - 11.09.2020 Messe München

Come visit us in hall 3b, booth 411!

Looking forward to seeing you there!



Actually, Alexander Krah was supposed to fly to the Philippines on the 12th of January. But the employees of Krah Pipes Manila told him that it wasn't the best time to visit the company in Dasmariñas/Cavite right now. The volcano Taal erupted on the 12th of January and a larger eruption was awaited in the near future. The company area and the hotel where he was supposed to stay were covered in ash and the alert level was raised to 4 (out of a maximum of 5). The

volcano Taal is located in the province of Batangas on the main island Luzon, nearly 66 kilometres south of the capital Manila. It's the second most active volcano in the Philippines and one of the most dangerous ones in the world. This means that there have been repeated eruptions in history. The last major eruption was in 1977, since 1572 there were 33 of them. In recent history the most disastrous one was in 1911. At that time, more than 1.300 people died. The Philippines are on the Pacific "Ring of Fire" - the geologically most active volcanic zone on earth with more than 450 volcanos. And that's how

Taal was created: Around 100.000 years ago, a huge eruption opened a crater, 25 to 30 kilometres wide. In this crater a lake with an island formed. Volcano Island is up to 311 meters high and in there again is a lake with a small island. Therefore, there is also a possibility of a tsunami during eruption. Today, several thousand people live on the Volcano Island, inhabiting an area of 23 square kilometres. More than half a million people had to be evacuated after the eruption on the 12th of January 2020. The lava as well as toxic gases and ashes were a high risk for them. They were all brought to evacuation centers, schools and other public buildings and



didn't know when or if they could return.

Our company in Dasmariñas, Krah Manila, is only 30 km away from Taal and experienced the effects of the eruption – everything is covered in ash, the air is very dusty and rain turned the ash into mud. On the 14th of January, the airport in Manila was opened again and despite the risk of another eruption of Taal, Alexander flew to Manila. Krah Pipes Manila has its own social program called “Krah Cares” and for sure we wanted to help those affected. On Alexander's first day at the company, they told him that three of the employees live close to Taal and were inside the evacuation-zone and therefore they had to leave their homes. Alexander went to meet Sherryl and

Zaldy, two of the affected workers to talk with them about Taal, the eruption and their view into the future.

S: I'm 38 yrs old from Mendez, Cavite. I am married and have got 1 child. I have been working with Krah Pipes since May 2016 as an HR Officer. During my freetime, I like playing with my daughter or do household chores.

Z: I am Zaldy. I am 37 years old with a wife and 2 children, a daughter and a

son. I am currently working as a machine operator in Krah Pipes Manila to provide for my family.

S: It is unbelievable and frightening because it is my first time to experience volcanic eruption. The activities of Taal volcano have been very disturbing and alarming, from Alert level 2 to Alert level 4 in a span of 4 hours. We have no electricity supply, ash fall comes with the rain (mud), every minute earthquakes which have increased in frequency and intensity, continuous volcanic lighting and thunder. Supply of water is not enough. Many evacuees from Batangas are temporarily evacuated in my hometown.



Z: The ash fall irritates the eyes and we experienced a lot of earthquakes. I was most afraid with the sudden rise of sea level because we live close to the sea.

S: I couldn't believe that Taal volcano is erupting during that time because as far as I know, I haven't heard any news about its sudden status. And it was perfectly fine when I saw it in the morning and in the afternoon of January 12.

Z: This is dangerous and life threatening.

S: Last January 12, me and my family

were in Balayan, Batangas, to attend a special event. There were no signs and indications that Taal volcano would be erupting soon.

Z: When it got worse I was at home with my whole family, my mother and other relatives. We were packing our things and preparing to leave if the situation became worse.

S: We saw the Taal Volcano at around 8:30 in the morning and during that time, it's perfectly fine. It was a sunny day, also, it was traffic because many tourists are in Tagaytay for the weekend. No

smoke or any indications of Taal eruption.

Z: Everything was sudden. But I remember that earthquakes were happening months before this eruption.

S: January 16, our local municipal government conducted a meeting on each Barangays to reveal the real situation and to clarify and to validate all directives of our town. Based on the report from PHILVOCS (Philippine Institute of Volcanology and Seismology), my hometown (Mendez) was within the 17km evacuation radius. And if the situation became worse, we would need to evacuate. Our LGU prepared buses to each Barangays to send the people to the evacuation area, located in Indang, Cavite – 20 minutes away from Mendez. Also, as per LGU, we don't need to panic because Tagaytay and Mendez is



a high place. And if we will base it on the ash fall we experienced, we are not that affected compared with other towns nearby.

Z: I heard it from the news. It was our barangay officials who assisted us.

S: Yes. My mother experienced the last Taal Volcanic eruption in 1977, but all she remembered was that many people were evacuated to Mendez. Also, when I met my former classmate in Highschool some time ago, she said that her mother experienced Taal eruption in 1965 and 1977, but her town Tagaytay is not that affected because it is high place.

Z: My father and other old neighbours also experienced the eruption in 1977.

S: As per our local government, our evacuation center will be in Indang Cavite (one of the towns in Cavite), 20 mins away from Mendez away from Tagaytay. But me and my family, will not go to evacuation center because I have my siblings in Manila, and San Pablo Laguna. Also, my in laws are in Pangasinan, one of the provinces in North.

Z: We are lucky to have relatives who live nearby but is outside the danger zone. We will only be able to go back to our own house once the authorities permit us.

S: The people who lived in volcano island who lost their home and the source of their income. The animals that were left behind because there is no way to save them all.

Z: When I think about my friends and neighbours who have lost their homes.

S: Some clothes, medicines and important documents. Things that will help us to survive.

Z: Only the important ones.

S: I go to work even if it is Alert level 4. I just pray to God to save His people and doesn't let anything worse happen. And I always think that Tagaytay and my hometown is in a high place and safe. Classes are suspended in nearby towns while the Taal Volcano is in Alert level 4.

Z: I am able to go back to work at KraH, but my kids have to stay home.

S: No. Honestly, we have no plans.

Z: Yes. We are ready just in case. We have already informed our relatives that we may stay with them once Taal totally erupts. All are things are packed as well.

S: Yes, It is my hometown. I have my

own house, but during the Taal eruption, me and my daughter stayed at my parents home, 15 minutes away from my home. (same hometown)

Z: Yes, I was born here. I live in my parents' house together with my whole family and other relatives.

S: No, it is not dangerous. I didn't think about moving to somewhere. I love my hometown. I love the weather and environment.

Z: Right now, the situation is really dangerous. I am planning to move to a farther place from Taal but still relatively close to my work.

S: Yes of course.

Z: Of course! Where would we live??

S: I have no plans. I believe God will protect us and that Taal Volcano will be the same again, calm and beautiful.

Z: No further plans for now. Hopefully, when the situation gets better, we will go back to our home.

S: It was a once in a lifetime experience. It touches my heart to see and to hear that people / donors / volunteers all over the Philippines went out their way to help the evacuees during their moment of crisis. It may take some time to recover



and to regain what was lost, but it just shows that no matter what crisis may come, people will hold with their faith and with each other.

Z: I always hope that Taal won't erupt anytime soon. We can't remain calm and peaceful because of its impending eruption. On the other side, we are very thankful to those people who are so willing to help us in situations like this. We cannot thank them enough! And in Jesus name, I hope everything goes back to normal, soon.

On Sunday, the 19th of January, three vehicles from the Krah company loaded with food drove into the regions where people had not yet left their homes because they didn't get a place in the national evacuation centers. A lot

of food and water was sold out in the supermarkets because everyone wanted to stock up in case of emergency. Therefore, there was not enough for everyone. In a small catholic church, bags with food and other important things were given to the people. On the way to the region and back there were a lot of people standing on the street with signs "Help us". For sure, we gave them bags too. There were a lot of little earthquakes in the last days, so that many houses were damaged, and streets cracked.

Hopefully, not too many people have lost their homes. Thanks to the fast evacuation, nobody died or was injured. That's because Taal is one of the best-monitored volcanos of the world due to its high activity. But as we heard afterwards, some people died in the evacuation centers due to diseases, because there were too many people in too little space.

Some people also ignored the warning to not return to their houses. Even some tourists came to the region to see Taal and take pictures – very careless.

But let's also look at the positive things - It was really impressive to see that a lot of people brought food into the affected regions with their mopeds, even though themselves have only little. It's great to see how they support each other in difficult times. Hopefully, Taal will calm down quickly and does not cause an even bigger catastrophe – fingers crossed!

Jenny & Krah Pipes Manila



In these days, it gets more and more important to be prepared for natural disasters. Every year, there are around 20.000 earthquakes worldwide, many of them resulting in tsunamis. Also, tornados can lead to tsunamis and heavy flooding. So what to do when the ground you're standing on isn't safe anymore?

was placed (including people) on sea, to see the stability of floating while people are moving inside. The Krah shelter is protected against big waves and can be easily located from the air – for a later rescue of the victims. The shelter can be used several times, due to the long-

life time of plastic. The used plastic is Polyethylene high density, in virgin or recycled grade.

:
Jenny and Lisa
KRAH Group

Dainippon Plastics in Japan has made a revolutionary development in terms of human shelters, made out of very stiff double wall Krah-Pipes. Inside is enough space to carry and protect 20 people. The pipe size is DN/ID2400 and a special high stiff and high floating wall structure. Beside special protection elements and gadgets, a complete toilet is integrated. A big storage-tank for all emergency items, like food, water, etc. is located under the seats. Many tests were done and also a real Tsunami Krah pipe shelter



A technical contribution of Dipl.-Ing. Stephan Füllgrabe, Krah Pipes Germany, based on a presentation at the II Water seminar of the German-Arab Association.

Water is the most important aliment for humans, as well as a good which can't be missed from any area of life. Whether it's in agriculture, industry, household or in your free time. However, water can also become a danger in contaminated form. With the dawn of civilization, the aim was to discharge contaminated water in canals and pipelines as so-called sewage, just as fresh water was fed into pipelines. Piping systems are, so to say, the veins of our civilization and an essential part of the underground infrastructure. Today, for reasons of sustainability, it is increasingly becoming a declared goal to use water as much as possible in multiple ways and ideally to keep it in circulation or in an extended cycle. The degree of expansion of the water cycle in pipes, canals and plants, in which water is transported, stored, distributed and treated, depends strongly on the locally available drinking water resources. If, in extreme cases, there is no source of fresh water, a complete water cycle, such as in space travel, for example, is even vital.

Climate change, water scarcity and urbanization probably are the most important challenges of our time, which affect every country worldwide – if also in different intensities. Current studies show that the rain period in the Near and Middle East will be shortened by half by the year of 2100 –

the dry period will be doubled at the same time. This will increase the current water problems and have dramatic consequences such as long-lasting drought periods, desertification or torrential heavy rain. We can't afford treating water so badly in the future. Which also means that the supply and disposal networks also must be adapted to the new challenges and changes.

This calls for a sustainable and modern water management, which basically means:

- Use existing water resources
- Distribute water in a sensible and targeted manner
- Avoid unnecessary pollution
- "De-pollute" contaminated water
- Lead water by degree of purity to multiple usage

Sewage and drainage pipe systems play an important role in water management. If these systems are on the state of the art and properly working, all factors listed above can be positively influenced. A modern and future-oriented canal infrastructure shows the following features:

- Sufficient dimensioning for current and future wastewater volumes
- Permanent tightness, i.e. no unnecessary infiltration and exfiltration, to protect groundwater and avoid consequential costs
- Flexible and bendable for more safety

during settlement

- Movements in the ground and earth quakes
- Homogeneously welded pipe system
- Service life > 100 years
- Decentralized temporary or permanent storage
- Targeted water distribution and drainage

This will be explained in the following using the Krah pipe system as example. Krah pipe systems have been used worldwide for decades under the synonym and brand name "Krah Pipes" for underground pipe construction dimensions. Depending on the application, laying conditions, static requirements and operating pressures, profiled or solid wall Polyethylene pipe systems are produced. The success of the Krah pipe system is based especially on its well thought-out and permanently tight connection system, the flexibility, the material-typical and normative secured longevity of more than 100 years, the large variety of diameters (from DN300-DN5000) and of course the use of high-quality, recyclable Polyethylene pipe materials. These advantages are not only appreciated in Germany, but all over the world and thus also in the Arab world. Today, Polyethylene pipe systems are manufactured in Krah production plants in more than 50 locations. This machine technology "Made in Germany" has become widely accepted especially in those areas where the underground infrastructure is still being built. On the one hand,



Pic 1: Heavy rain, overflowed sewage canals in Germany



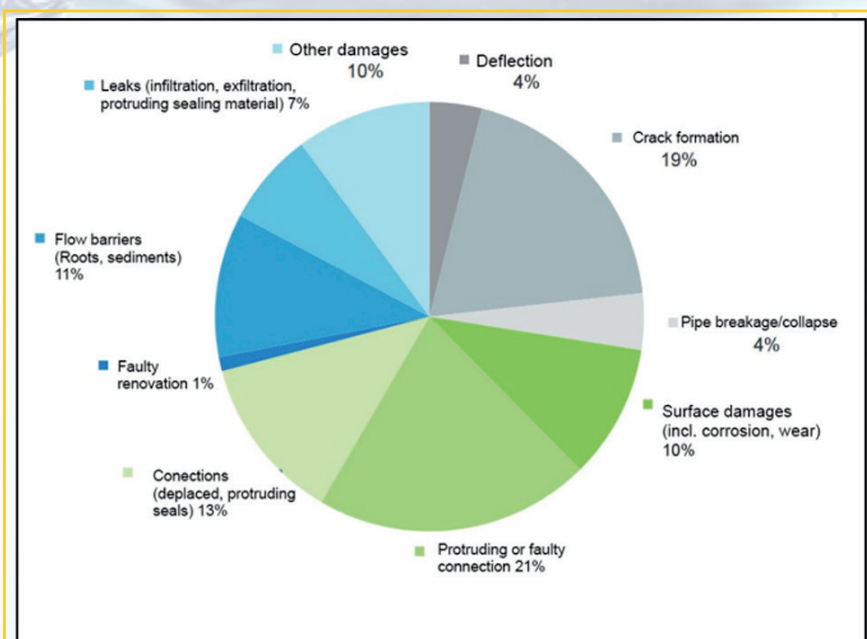
Pic 2: Heavy rain, overflowed sewage canals in Arabian countries

this is due to the great backlog demand, but also to the awareness of the necessity of a safe, sustainable and long-lasting pipe system. Adapted to the conditions on site, Kraiburg supports the locally responsible people with know-how transfer in the construction and operation of factories and thus supports the creation of new jobs. This also includes appropriate trainings for management, employees and pipe fitters, support in the establishment of a quality assurance system and the promotion of the exchange of experience with other factories worldwide. The application of Kraiburg pipes is possible in diameters from DN/ID300mm – DN/ID5000mm, which has the big advantage of being able to build

whole pipe systems in monolithic design. That means that pipes, fittings, tanks as well as dams and reservoirs can be manufactured from one material. This monolithic design also includes the connection technology, for modern Polyethylene pipe systems are delivered with an integrated electro-fusion socket. This technique enables a permanently tight connection by simply pressing a button and this within minutes. This non-detachable and axially tension-proof connection technology offers, together with the great flexibility of the material and pipe system, an absolute, homogenous, flexible pipeline, which also guarantees the needed density during soil movements or placing. Even during earth-

quakes this system has proven itself. The tight connection or the permanent loss-free transport should actually be a core requirement for any pipe system. Unfortunately, however, reality shows figures that cannot be reconciled with this. In Germany, underground supply pipes alone are assumed to lose more than 10% of water; in other European countries, the loss values sometimes reach 20 or 30%, and in the Middle East even peaks of more than 50%. For disposal pipe systems there is a lack of reliable figures for the actual water loss, but surveys and projections by the DWA for 2015 show that in Germany, for example, approx. 20 to 25% of sewers show medium, severe or very significant damage. The type of damage has also been investigated and evaluated in detail several times in the past. The results show that more than 1/3 of all damage in sewer systems is due to leaking joints, shifted joint connections and defective connections. These are all good reasons for a flexible and homogeneously welded Polyethylene pipe system.

But exfiltration of waste water shouldn't only be the loss of a processable material, but more like a contamination of the surrounding soil or groundwater. In addition, unwanted infiltration of groundwater and surface water can overload the sewer system and the volume of wastewater to





Pic 3: Krah Pipes England



Pic 4: Krah Pipes Oman



Pic 5: Krah Pipes Egypt

be treated increases accordingly. Apart from the environmental damage, this is a cost factor not to be underestimated for sewage treatment plants integrated into the wastewater pipe network. Against this background, and considering the state of the art, it is even more incomprehensible that pipe systems that are plugged, are put out to tender and used. A homogeneous and welded pipe system is clearly the better solution and not more expensive. Moreover, it is an instrument for saving costs in the future, either by reducing operating costs or by avoiding follow-up costs, such as repairs, undermining roads, contaminated soil and other aspects. Besides the loss-free transport, sewer pipe systems also have another important task. Due to their storage volume they can be an important control unit for water management. Germany alone has a sewer network of around 1.800.000 kilometers, 600.000 of them being public channels. The public network in Germany would be able to go around the globe 15 times if it was strung together. The storage and intermediate storage volume provided by the system is correspondingly large, plus extra-dimensioned, large-volume storage

channels. Sensibly integrated into the sewer network, such water reservoirs reduce or prevent flooding, as has become increasingly common in recent years with the extreme weather events of recent years (see Figures 1 and 2). In Germany alone, there is an increasing trend towards more than 50,000 such decentralised integrated intermediate storage tanks/storage channels. This type of decentralised water storage is currently still rarely found in the Near and Middle East; far more often, large above-ground construction measures such as dams etc. are found. With the Krah Pipes production and manufacturing technology it is possible to manufacture such decentral storage facilities including directly connected manholes in modular construction and pre-fabricate them in the factory. This saves a lot of time during installation and enables complex structures. To use the rainwater, the pollution on the way to storage must be kept to a minimum, either by fluidic and hydrostatic devices or by targeted filtering. The typical further use is then in the irrigation sector, in subordinate water applications in the household, e.g. toilet flushing, storage of fire water or also industrial applications.

In view of the water shortage of last summer, it becomes clear how urgently necessary a rethinking in households with water supplies is. The withdrawal of water from such artificial reservoirs conserves natural water resources. Here, the requirements and points of view differ considerably, both nationally and internationally. Religious aspects can also play a role in the use of so-called "grey water" (faecal-free wastewater). Targeted percolation can also be quite useful. Especially against the background that the climate has already noticeably changed and the increasing soil sealing, especially in the cities, has an additional influence. For the first time since the mid-2010s, more people worldwide are living in cities than in rural areas. In the world's metropolises, the associated land sealing is leading to a reduction in natural seepage and thus also to less evaporation. This in turn causes local temperatures to rise, with corresponding consequential costs. Finally, when talking about integrated artificial water reservoirs, on the water supply side there are also corresponding drinking water reservoirs, which in recent years have increasingly been manufactured from Polyethylene pipe systems.

Here again, the reasons are, in particular, the permanent tightness and the longevity, as well as the possibility to prefabricate the structures in the factory including all necessary installations (valves, piping systems, electrics) due to the low weight and the modular design. Krah customers from Germany are worldwide leading in the field of these polyethylene structures and drinking water storage tanks. With regard to the application in Arabic countries, this results in good possibilities of cooperation in planning, manufacturing and operating such structures.



Pic 6: Krah Pipes rainwater reservoir

A functioning and safe pipe network, in which water is transported without loss, distributed and stored in a targeted manner, and discharged and treated, is the basis for sustainable and future-oriented water management. Waste water is polluted water and thus a valuable material that can be reused or treated and kept in circulation with our technical possibilities. Flexible and homogeneously welded polyethylene pipe systems offer the necessary security against leaks and for a long service life in all nominal diameters up to DN 5000 mm. Today, modern systems such as Krah Pipes are

expected to have a service life of more than 100 years and even after that, the material polyethylene can still be 100% recycled. Exfiltration's and infiltrations of leaky sewer pipes lead to avoidable environmental damage and consequential costs. The longitudinal force-locking welded joint is the most economically and ecologically sensible joining technique for underground pipe systems. Another important task of pipe systems is the decentralised storage of water or wastewater. Decentralised storage is an essential control instrument for counteracting extreme weather conditions.

They are a useful supplement to above-ground dams and storage structures. The modular design of such structures made of polyethylene and their factory prefabrication create advantages during installation and open up to potential savings during operation.

:
Dipl.-Ing. Stephan Füllgrabe
Krah Pipes GmbH & Co. KG



Pic 7: Krah Pipes infiltration pipes, Oman (with and without Geotextile-filter fleece)

Belgrano Cargas railway network extends through the provinces of Buenos Aires, Santa Fe, Córdoba, Mendoza, Santiago del Estero, San Juan, La Rioja, Catamarca, Tucumán, Chaco, Formosa, Salta and Jujuy. The line also reaches all the Argentina's neighbouring countries, such as Bolivia, Uruguay, Brazil, Chile and Paraguay.

Together with other works for an investment of 120 million Dollars it will allow the direct entry of the train to the large agro-export terminals, which may receive twice as many grains and export 25 million tons to the world; in the Belgrano

Cargas a new railway branch was not re-activated since 1947; For the first time, a 100-car train entered the new "La Ribera" railway beach in Timbúes, Santa Fe. It is a bypass that avoids the freight train, key to transport the harvest, enter the city of Santa Fe. The trace will allow Belgrano Cargas trains that come from the northern and northwestern provinces to Gran Rosario port area not having to enter the urban area of the capital city, bordering it on the new perimeter ring.

With this investment, 62 level crossings will be eliminated, and traffic safety and speed conditions will be improved. In fact, it will significantly boost Belgrano Cargas that will reduce the travel time of 10 hours between Santa Fe and Rosario, as it is today, to two and a half hours.

This project is very important for the city of Santa Fe, for the entire Metropolitan Area, for the province of Santa Fe and for the country. Because it will be the first major railway bypass of a metropolitan area throughout Argentina. And it is the product of the will of the Argentines and the national government to recover the freight train. This work began in December 2019 and its completion is expected towards the end of 2021.

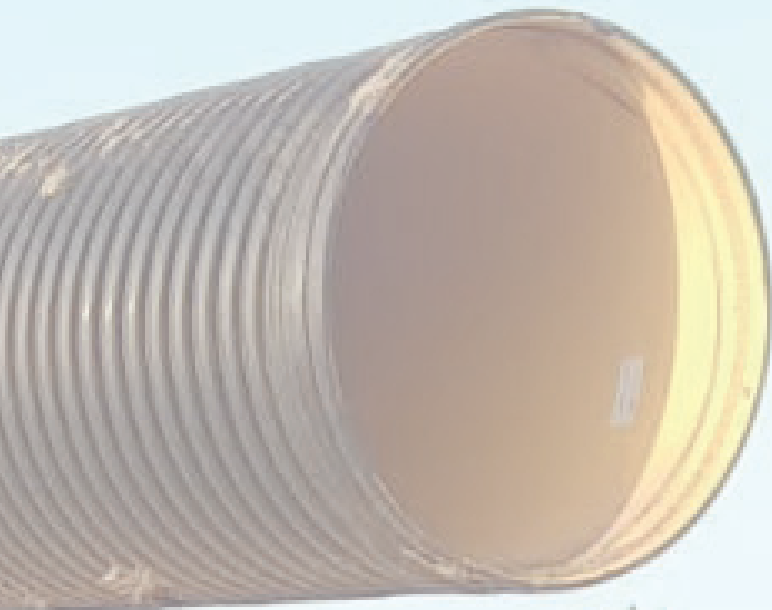
During this time, almost 8,000 meters of Krah pipes will be installed in five different diameters, ranging from 600 mm to 1400 mm. This project generates positive impacts, because it allows expanding the

productive frontiers towards the north and, in turn, transforms the day-to-day life of the capital of Santa Fe inhabitants. In addition, the project is part of the Belgrano Cargas infrastructure recovery process, along with the incorporation of new rolling stock and improvements in management and technology that resulted in the 1,180 km stretch from the Province of Salta, to Timbúes, in Rosario where the time to make the journey was reduced to 7 days, against the 15 it took in 2015, and will reach 3 by the end of 2020. The numbers are already very encouraging, in April, the Belgrano Cargas railway reached to transport 185,818 tons, 181% more than in 2015 when 64,500 tons were transported and sets the record for the last 26 years. On the other hand, the infrastructure meets the standards for the transit of 100-car formations such as the one that arrived at the port of Timbúes days ago. It is the first train of the Belgrano Line that transported a hundred wagons from the Province of Salta, for the first time in the country's railway history. As members of Krah Community we are proud to be part of this history of road growth and consequently economic growth of such an important region of our country.

We are Krah!

Krah América Latina





- 8000 meters of Krah pipes
- 5 different diameters
- ranging from 600 to 1400 mm
- 120 million Dollar investment
- 25 million tons export of grain
- 62 level crossing eliminated



At first sight, sewage systems and the Corona virus seem to have nothing in common. But let's take a closer look at the virus and its transmission. The Corona virus (named "Covid-19: Corona virus disease 2019") was first detected in Wuhan City, Hubei Province, China on the 31st of December 2019.

From there, the virus spread rapidly from person to person in parts of the country. On January 30, 2020, the International Health Regulations Emergency Committee of the World Health Organization (WHO) declared the outbreak a "public health emergency of international concern". Infections with Covid-19, most of them associated with travel from Wuhan, also are being reported in a growing number of international locations, including the United States. Also in Germany, currently 4838 persons are infected, as stated from the Robert-Koch-Institute in Germany (as of 17th March 2020).

Corona viruses are a large family of viruses that are common in many different species of animals, including camels, cattle, cats, and bats. Rarely, animal viruses can infect people and then spread between people such as MERS and SARS in the last years, and now with Covid-19. Many of the patients in the outbreak of respiratory illness caused by Covid-19 in Wuhan, China had some link to a large seafood and animal market, suggesting animal-to-person spread. Later, a growing number of patients

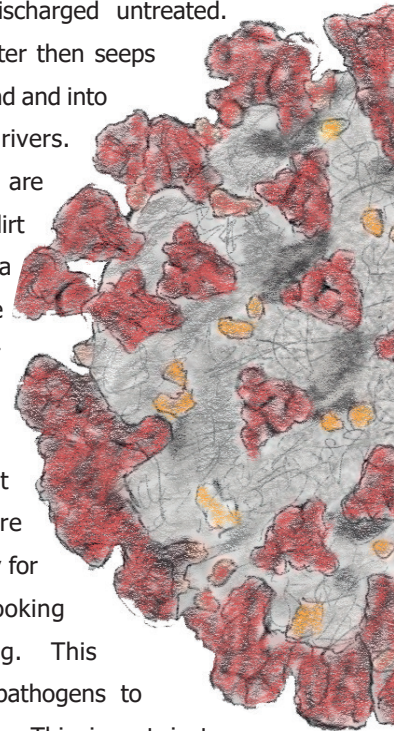
reportedly did not have exposure to animal markets, indicating person-to-person spread. After the virus became known, more and more cases were reported each day and also more and more people died. Altogether, more than 3100 people died in China, more than 80000 got infected – and up to today, nobody can tell how many will follow. Recently, researchers and doctors have discovered that, in addition to infection via droplet infection, there is an additional transmission route - via the digestive tract. This was also the case with the SARS epidemic a few years back, a virus similar to Corona. A few weeks ago, researchers from the Shi Zhengli Laboratory at the Wuhan Institute of Virology found genetic traces of Corona virus in stool samples from infected patients.

Colleagues from the USA also confirmed these findings. These genetic traces, also known as ribonucleic acids, indicate that the disease can continue to exist in the stool and can therefore naturally be transmitted. Smallest amounts of these viruses further, from the hand they pass quickly into the mouth and can lead to infection. In some cases, infection is also possible via contaminated water - in water the viruses survive for several weeks. During the SARS epidemic in 2003, the virus was found to remain stable in the faeces of infected people for up to four days. As a result, a considerable viral load was released into

the sewage system. An old, dilapidated sewage system can dramatically increase the spread of the virus. This then mainly affects the poorest countries, which often have old and damaged sewage systems. Many developing countries don't even have a sewage system where, according to the United Nations, 90 percent of sewage is discharged untreated.

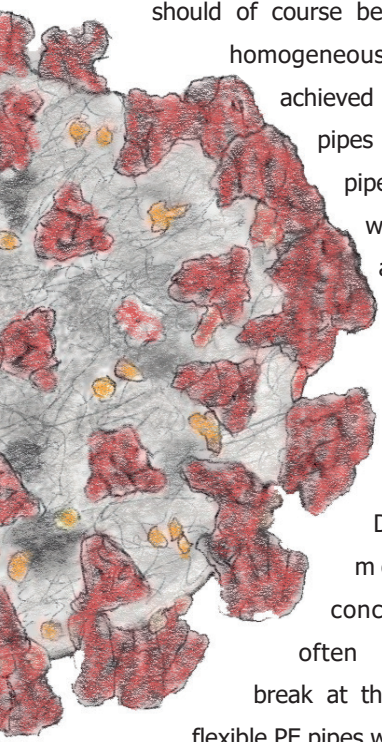
The wastewater then seeps into the ground and into lakes and rivers. Where there are no toilets, dirt and bacteria enter the groundwater unfiltered - the same water that people there use every day for drinking, cooking and washing. This is ideal for pathogens to spread rapidly. This is not just about the current Corona virus - the next virus is already on its way.

But how exactly can a sewage system help stopping the virus to spread? First of all, the pipelines have to be stable and sustainable, to lead sewage water where it is supposed to be – to water treatment plants. This can only be reached by PE pipes, which guarantee a lifetime of 100 years. Concrete pipes are quickly attacked by sewage and become dilapidated,



cracks form, and sewage emerges and gets lead into the environment. Due to the increasing climate change situation, the pipes should also have a sufficient large diameter, because in the coming years there will be more and more storms, floods and other catastrophes in which a well-functioning sewage system is a prerequisite for draining the massive water masses. Otherwise, there will be repeated floods in which streets, houses and families will be in water - optimal conditions for the transmission of a disease via water.

Furthermore, the sewage system should of course be leak-proof. A homogeneous system is achieved with our Krah pipes by welding the pipe connections, which guarantee a 100% tightness. Important is also the stability of the pipes. During earth movements, concrete pipes often crack and break at the joints - our flexible PE pipes withstand these vibrations and the welded joints also remain tight.



A functioning and durable sewage system can contribute a large part to this. Rainwater and contaminated water must be drained and purified as quickly and safely as possible to prevent the spread of diseases. This should not only be standard practice in the rich countries - the poorest in the most populous countries should have a right to it, because here it is a crucial point for a life worth living and healthy.

:
Jenny
KRAH Group

To sum up, a well-functioning, sustainable sewage system must be Tightness, dimensioning, durability, flexibility - exactly what our Krah-pipes provide. The appearance of ever new pathogens cannot be prevented with the increasing number of people - but the transmission of the pathogens can.

Betzdorfer Str. 8
57520 Schutzbach - www.krah.net
Germany

IMPROFIL