



World Heritage Tour Augsburg

The capital of fountains and water towers, canals and
hydropower stations



Audio Point 1: Augustus Fountain

You're listening to the water audio tour in Augsburg. Our starting point is the Town Hall Square, right beside one of Augsburg's most famous decorative fountains: the Augustus Fountain. In winter you can't see much of it, it's covered with planks - but if you visit at other times of the year, you'll certainly notice what made this fountain so famous all over Europe in its day:

water splashing

The splashing water! Or, more specifically, the technology behind it!

It's quite normal for us today to see water splashing from a fountain. In the 16th century however, this was something special, a technological sensation. Because to make the water splash, you need water pressure - and Augsburg was one of the first cities to create that pressure by means of an ingenious system of artificial canals, water towers and waterpipes, all of them located both inside and outside the city. You'll be discovering them on this tour. And after the tour you'll probably be as astonished as the many tourists who also came here during the Middle Ages to admire the fountains, canals and towers of Augsburg, which were famed throughout Europe.

How proud the people of Augsburg have always been of their water is demonstrated by the Augustus Fountain here. It was built in 1594 as a status symbol, demonstrating the city's sheer abundance of water.

On top of the fountain you can see the man who founded Augsburg in around 15 BC - the Emperor Augustus. City guide Elisabeth Retsch is here with us:

„Augustus was the first emperor of the Roman Empire, and during his reign, Drusus and Tiberius, his two stepsons, marched into the region north of the Alps and founded an army camp here, a settlement, just at the confluence of the rivers Lech and Wertach. The settlement gradually grew larger, and eventually became the capital of the Roman province of Rhaetia. Rhaetia was a region that extended a long way into Switzerland from the River Inn.“

The fact that the Romans built the capital of Rhaetia right here was probably due to the abundant water offered by the region. The four most important rivers of Augsburg are represented as statues on the Augustus Fountain.

Take a look at the large figures, located around the edge of the basin.

The man with his hand on the rudder symbolizes the longest and oldest river in the region, the Lech.

Many rafts used to float down it, so it was an important waterway for Augsburg, enabling trade to develop here – trade that would also make one of the most well-known merchant families in Europe’s history, the Fugger family, so wealthy.

If you continue clockwise round the fountain, you’ll see a woman leaning on a mill wheel.

Historians are still wondering which river she represents – recent research points to the Singold. The mill wheel is a symbol of the many watermills that existed in Augsburg since the Roman era.

On to the next figure.

The man with the fishing net probably stands for the River Wertach, which, even today, still contains plenty of fish.

And the fourth figure represents the Brunnenbach, or „fountain stream“ in English.

He’s holding a decorative pitcher in his right hand and a cornucopia, or horn of plenty, in his left. We’ll be encountering this little stream several times during our audio tour; it used to supply the people of Augsburg with their drinking water. The city’s drinking water is still excellent, and you’ll find out where it comes from and how it gets here a little later on, when we reach the City Forest.

There’s another striking feature on this fountain - in the middle of it, on the column: the women with water spraying from their breasts.

water splashing

„Those are the so-called Herma, and the water spraying out is simply supposed to depict abundance. The city of Augsburg would never have been able to develop in such a way if it hadn’t had such a huge amount of water.“

In the 18th and 19th centuries, thanks to water, the city became a European metropolis of the textile industry, and hydropower had already been boosting business here ever since the Middle Ages. And where? In the old artisan quarter, which we’ll be showing you next. Audio point 2 is located beside one of the many canals - at the Vorderer Lech, under a large weeping willow. We’ll be back in touch there. See you soon!

Audio Point 2: Vorderer Lech Hydropower station

Audio point 2: We’re now standing below the hydropower station. The Lech canal here, the so-called Vorderer Lech, is one of many canals in the Old Town – even the Romans diverted water into the city, and the canal system was developed further ever since. Today, the city has a total of 199 kilometres of flowing water – and that has made the city rich, above all because of the power it generates. Look down into the canal and you’ll gain a good impression of that power. Just look at how fast the water is flowing!

This high flow rate is because there's a difference in elevation in Augsburg of around 30 metres - remember the steps you just walked down from the Town Hall Square? The Romans knew how these differences in height could be suitably exploited.

water running

They built the first canals to power their mills 2000 years ago.

waterwheel rattling

And listen to what was going on in this part of the city during the Middle Ages.

waterwheel rattling, blacksmith hammering, horse neighing, human voices, animals

Waterwheels rattled everywhere. There were mills for oil, paint or grain. The canals were ideal for any profession that needed water - for tanners, for example, but also for dyers and soap-makers.

We'd probably have held our noses at this point though - because in the Middle Ages, these canals also had another, very different function: they were used to collect waste. Nicolas Liebig from the Augsburg Landscape Conservation Society is here to explain this in more detail:

„It would have stunk quite a bit, because the canals weren't only used for hydropower - people used to chuck all kinds of rubbish into them as well. Faeces, for instance, or tannins from the tanneries, or dead animals, waste from the slaughterhouses, and so forth - it was all simply thrown into these canals.“

And all that would have been floating past us right now, producing its various different aromas.

So let's leave the Middle Ages now, and move on to 18th and 19th centuries!

water and machinery running

Augsburg now became THE city of industrialization in southern Germany. Large textile and paper factories were built here - mainly because of the hydropower that moved their machinery.

And today - water is continuing to work hard for the people of Augsburg, by producing electricity. At this hydropower plant here, for instance. Walk a few metres up the canal so that you can see the upper part of it.

It's one of the smallest in the city. From 1837 onwards, there used to be a grain mill - today, the water powers a turbine, and the plant is fully automated. The metal grille in the water keeps out twigs and leaves, and the metal arm above it is there to keep the grille clear so that it doesn't clog up.

Altogether, there are 35 hydropower plants in Augsburg - and they're more profitable than ever. Markus Haller, from the Augsburg Civil Engineering Department, explains. He is responsible for all the bodies of water in the city: „There was a time when fuels such as oil and gas were so cheap that power plants like these were shut down. And nowadays, with the debate about fossil fuels, the

small hydropower plants are becoming more interesting again, and are more likely to be reactivated than shut down.“

We'll now head off towards the next audio point – it's inside the city moat, beside the stream. On the way there, you can take a look at the city's many bridges. Augsburg has 530 of them - more than in Venice. Have fun counting them all, and see you soon!

Audio Point 3: City Moat

Audio point 3 is inside the former city moat of Augsburg. This is just the right place to forget all about the city around us for a little while.

So: let's allow the noise from the large street to gently fade into the background ...

traffic noise stops

And suddenly, we're in the midst of nature.

birds chirping

The stream here is in such a natural state that we can observe some rare animal species. This bird, for example:

kingfisher calling

It's a kingfisher. If you listen carefully and watch closely - you may even spot it. Nicolas Liebig:

„You're here in the middle of the city, listening to the traffic sounds, and then a kingfisher suddenly flies past you. Many people don't know about that - because they walk hectically through the city centre, lugging their shopping bags. The kingfisher hunts small fish here and makes a very distinctive whistling sound, and when you hear it, you know you have to look around and try to spot it. It's also called the flying gem, it's a shimmering blue on top and reddish underneath. It has a few other colours too, and a very pointed beak. It often sits on overhanging branches, and then suddenly dives down to catch fish.“

Nicolas Liebig and his colleagues from the Landscape Conservation Society are proud that the kingfisher lives here – after all, this rare bird is very fussy about its habitat. It needs a clean stream, lots of fish, and natural riverbanks, and all of that is available in Augsburg – also thanks to the water, which has created a natural habitat here.

Another creature that appreciates these numerous canals is the beaver. There are currently 100 beavers in the city – and they've divided up the water into 20 different territories.

„Well, I've already seen a beaver right in the middle of the city – he was swimming along the city moat quite calmly with a few branches in his mouth. They feel very much at home here - you can see lots of branches and weeds and herbs, and that's what beavers feed on. They also make their dams in the city moat. This is their territory.“

As you walk along this path, take a look down at the bases of the tree trunks. You'll see that some of them are encircled by wire netting - to prevent the beaver from felling them.

wood creaking

Because beavers are famously busy!

tree falling

However idyllic this city moat seems today, its original purpose was a military one: it was dug to protect the city from enemies. This was why the people of Augsburg diverted water here and filled the moat shortly after the city was founded.

„This isn't a popular route to take - and in the old days, if there were archers or similar on the other side, things would have been even trickier. Augsburg is very old, and was often attacked by enemies in its history - and a very effective means of defence was a city moat filled with water. So that was the original idea: the more water there was around Augsburg, the safer the city was.“

It's clear: the people of Augsburg have always been ingenious where water is concerned. We'll be seeing the next example of that at the city's "Red Gate" - our next audio point.

Audio Point 4: Red Gate / Water towers

Audio point 4 is one of the landmarks of Augsburg: the Red Gate. Actually it's only red on top; the bottom bit is grey. It was built in 1604, just the way it looks today, by Augsburg's master architect Elias Holl. On the one hand it served as a city gate, while on the other it was also a status symbol of the people of Augsburg - demonstrating the power and wealth of their city to everyone from afar.

The passage beneath the gate is mostly closed these days - the open-air stage of the city theatre is located just beyond it.

And to the left of the Red Gate, a bit further back, you can see THE two attractions of the city where water is concerned: the water towers. A small one and a large one. They provided the city with drinking water until the 19th century - and also ensured that water splashed out of the fountains in the city centre.

water splashing

Remember the Augustus Fountain!

water splashing

To explain how the system worked, city guide Elisabeth Retsch and I are now inside the larger of the two towers and we're doing exactly what the water in the tower used to do - we're moving upwards.

steps on stair

We're taking the stairs - the water, however, once had to rise up into this tower along brass pipes - driven by a pump. *„There were waterwheels in the cellar that set the pumps in motion, and every time the pump descended, it pushed a few litres of water upwards.“*

Arriving at the top, the water then flowed into a pressure vessel ...

water flowing

... which was located at the same level as the oval window in the large tower.

water flowing

In this pressure vessel, the water came to rest for a short while, and then it did something we'd do best not to copy. It plunged back down into the depths.

„Yes, exactly. It fell down through a thicker pipe. Then, roughly at the level of the ground floor, it was diverted into a pipe leading outside, and then underground, and was then distributed to the city's different streets.“

And now a question for all those who paid attention during their physics lessons: Why did the water have to climb up here to such a high location?

Well it's to do with the fact that these towers are in the lower part of the city, which were also supplied with drinking water. The fountains of Augsburg however, where the water was supposed to go, are located in the upper part of the city - about 8 to 10 metres higher up. For the water to flow there with enough pressure, two conditions had to be met.

„On the one hand, this requires constantly flowing water, which builds up the pressure and pushes the water forward, and, on the other hand, a technical concept to allow the water to flow upward - that's the principle of 'communicating vessels'. In other words, if there's an open pipe anywhere and water flows in, it doesn't matter how the pipe is laid - the water flows along it and can only rise as far as the pipe's initial height. For the towers, that meant that they had to be higher than the road level at Maximilianstraße. Because then the water could flow upwards and supply all the city's fountains.“

Augsburg was one of the first cities with a drinking water supply like that - from the year 1412 onwards! That meant that the builders of its wells and fountains were among the leaders of Europe! If you'd like to see the towers from the inside, we recommend a guided tour - you can book one at Tourist Information.

By the way, just in front of the small water tower was where the apartment belonging to the 'fountain-master' was located. He was the man responsible for the distribution of water within the city.

And further to the left, in the large building, is the famous Augsburger Puppenkiste - the only theatre in the city that is almost always sold out - with roughly 200 seats.

We'll now continue our tour further into the Augsburg city forest. Underneath it is one of the greatest treasures of the people of Augsburg - their drinking water. It's among the very best in Germany.

Just take tram No. 2 from the Red Gate, or Rotes Tor, to stop „Sportanlage Süd“.

Audio point 5 awaits you at the beginning of the nature reserve, next to a blue information board. See you soon!

Info Point: Tram Stop “Rotes Tor”

Take the tram number 2 and get off at the stop “Sportanlage Süd“

Info Point: Tram Stop “Sportanlage Süd“

Walk to audio point number 5.

Audio Point 5: Beginn des Natur- und Trinkwasserschutzgebiets - Beginning of the nature and drinking water preservation area

This is the audio point 5 of the Augsburg Water Tour. We're here at the beginning of the city forest of Augsburg, the so-called „Siebentischwald“. It's one of the largest nature reserves in Bavaria, and also a drinking water protection area - the drinking water for 300,000 citizens comes from this region. Nicolas Liebig from the Augsburger Landscape Conservation Society explains why the water here is of such high quality.

„It's related to the fact that there's no human influence here at all. It's a huge area, 22.5 square kilometers, without a single road going through it, without any industrial or commercial areas - so there are no locations where the drinking water could be polluted or contaminated. And that's the huge advantage.“

And to make sure things stay that way, everything is strictly monitored and there are clear guidelines. Only those with special permits have access to the protection area, which is located right beside the drinking-water springs. Everyone is authorized to go to our next audio point on this tour, however: the groundwater measuring station. It's a prominent blue column next to another info board, and you'll notice it in a few hundred metres. See you there!

Audio Point 6: Grundwassermessstelle - Groundwater Measuring Station

Audio point 6: We've arrived at the groundwater measuring station. The water flowing beneath our feet right now is the same water that will soon emerge from Augsburg's water-taps...

water running from tap

... and the people there can also drink it without hesitation - in fact it's even suitable for baby food!

The digital display on the column shows you exactly how deep the groundwater is right now. Normally, the groundwater level is only 1 to 2 meters below the surface. Nicolas Liebig:

„This is typical of a floodplain. Right now we're on a floodplain of the Lech river, and on floodplains the ground water level is usually very high, so it's very close to the surface. The groundwater levels also change depending on whether the Lech is carrying floodwater or not.“

Picture the groundwater as a huge underground river, seeping through the soil and slowly flowing towards the Lech - and in several places there are wells that bring up the water from the depths.

„You can think of it as a straw: With this straw, the water is sucked off and then guided into collection basins and pipeline networks - and finally, the people of Augsburg can drink this water. And there's no added chlorine or anything else. The water doesn't have to be purified.“

A special filter ensures that the water is so clean - and to understand how it works, we need rain. So, we'll provide a serious downpour...

rain pouring down

..and then look down at the ground, at where the raindrops are slowly seeping into the soil - and here you see the top layer of this filter - the grass and the plants - and below them, the humus, or topsoil. This layer is only about 20 centimeters thick here, but it's enough to filter most of the pollutants from the rainwater.

„Here, the hollow spaces get smaller and smaller, and the water has to flow through progressively narrow crevices, so it increasingly becomes better filtered. There are also lots of micro-organisms living in this upper soil that contribute to the filtration. Bacteria, algae, smaller creatures like springtails, etc. - a variety of small organisms contribute to the filtration.“

Once the rainwater has seeped through this upper layer of the soil it meets the next filter: a layer of gravel about a metre thick, located beneath the humus and the grass. The water seeps down through it even further until it reaches the groundwater. At some locations here on the heath without any grass you can see this gravel - it's an old riverbed that the Lech left behind a long time ago.

And now that we've talked so much about water, you can dip your feet in it: at audio point 7, by the so-called "Stempflebach", near the wooden bridge.

Audio Point 7: Stempflebach - Wooden bridge

water splashing

Audio point 7 is a spa stop for your feet. So follow our example, and dangle your feet in the water -

water splashing

...and you'll notice that this stream is...well, yes...

water splashing

...surprisingly cool! Generally it never gets warmer than 10 degrees - even in the summer. The reason is that it's spring water - meaning the stream is fed by groundwater that comes out of the earth. That's why it's so clean and pure, enabling many rare species to live here.

Turn over one of the stones in the stream, for instance, and look at what's underneath - you may discover quite a few things. Nicolas Liebig:

„Hidden under the stones and protected from the current are lots of insect larvae, and they've developed some fascinating survival strategies. For example, you may see the caddis-fly here - it builds its own small house out of pebbles.“

The blue information board shows even more larvae and crabs that live under the stones. They are all proof that the water in this stream is very clean.

Between June and October, rare dragonflies also come here - the beautiful banded demoiselle, for example. And be on the lookout: the male dragonflies have fierce battles with each other. It's all about getting the best possible spots to be seen by the females - reeds hanging over the water are especially popular!

„To get hold of one of these reeds, they really fight - that means, they push each other off the reed. One flies up from behind to push the other one off. You can see here how tough the fights are.“

When a male dragonfly has successfully conquered a reed, he waits for a female.

„During the daytime the females are further away from the water, hunting for smaller insects to strengthen themselves, and in the afternoon, they fly to the stream to meet the males and the suitors. They then actually fly along the stream keeping a lookout for the best-positioned males - and that's when the mating ritual starts.“

romantic music playing

This is where things get romantic: because when a pair of dragonflies have found each other, they cling together to form the shape of a heart. You can literally see little hearts flying through the air - a sign that the fierce battle of the dragonflies has come to a happy end.

We'll be back in touch again at audio point 8, where there'll be another happy end - this time, one for toads.

toads croaking

Audio Point 8: Toad pond

Audio point 8 is at the toad pond. If you're here in the spring, you'll be able to hear the frogs and toads croaking in real life.

toads croaking

That's when they come to the water here to lay their spawn, from which the tadpoles later hatch.

Now imagine a pool like this one drying out. Then the toads have a big problem - they can't reproduce, because the water is missing. A toad tragedy like that actually took place just a few years ago in this very forest - humans were to blame for it. They had straightened the course of the Lech River in 1920, thereby lowering the groundwater level. Almost all of the ponds dried up... for decades...

toads stop croaking

...until the 'US cavalry' arrived in the shape of the Landscape Conservation Society. In 2011, this pool and two others were artificially created - and shortly afterwards, the croaking started again.

toads start croaking again

Nicolas Liebig:

„Yes, even in the very first year there were up to 50 toads in each of these three pools and they laid their spawn there. It was a success. Common toads can grow up to 30 years old, and that was our good fortune - there were clearly still enough toads in this dry area waiting for a pond to appear. During the first year we already had a huge number of tadpoles, so we've probably managed to secure this population.“

The crater containing the pool was actually made by a Second World War bomb. The Landscape Conservation Society has sealed it with clay so that rainwater gathers in it. As you walk through the forest, you'll catch sight of several similar bomb craters.

„That was a cruel time. Like many other German cities, Augsburg was also subjected to heavy bombardments - here, we're not far away from one of the city's former airfields. There were a lot of military machines of the German army here, and so of course the Allies flew fierce bombing campaigns and lots of bombs fell on this forest as well.“

We're now headed for the so-called Hochablass, a high weir. The location of the next audio point on this tour isn't all that important actually, because the talented drumming sounds we'll be introducing you to can be seen and heard everywhere in this forest ... If you're curious, listen to audio point 9 right now.

Audio Point 9: Drum Concert

Audio point 9 is on the way to the Hochablass - just carry on walking and, with a little luck, you might experience one of the drumming concerts that the Augsburg city forest is famous for.

woodpecker drumming, birds chirping

We'd now like to introduce you to these talented drummers - for example, the black woodpecker...

woodpecker drumming

If you can hear it, you have a good chance of seeing it too, because it's the largest domestic species of woodpecker. Nicolas Liebig:

„It's almost as large as a crow and, as the name suggests, almost entirely black. It has a red cap, which is somewhat larger on the male than on the female. It has a bright beak, white eyes and often calls during flight.“

black woodpecker calling

Also easy to recognise is the great spotted woodpecker because of its striking plumage. It is black, white and red. The great spotted woodpecker is the most common species here. All in all, 7 different species of woodpeckers live in the city forest – it's unusual to have so many together – and among them are very rare species such as the middle-spotted woodpecker, and the wryneck.

„This is because we have a forest here that is almost untouched, a forest in which trees are allowed to grow really old, where trees are allowed to die while upright, and aren't removed right away. That's one of the main reasons why woodpeckers feel very much at home here.“

woodpecker drumming

If you happen to hear a drumming sound like that, a woodpecker is performing an incredible feat: banging his beak into a tree 20 times a second – that's nearly as fast as a jackhammer.

woodpecker drumming

„I'm an ornithologist, I've been doing this since I was a child – and when I see woodpeckers I still think to myself how stupid can you be to ram your head and your beak against a tree-trunk like that. Naturally, it's all for important reasons: they're looking for food - caterpillars and larvae they find under the bark or in the wood – and they also do it to build their burrows, in which they raise their offspring. The great thing is that woodpeckers build a new burrow every year. The old ones are then left vacant for bats and other bird species - or even dormice, for example.“

The speed at which woodpeckers ram their beaks against the wood is enormous - up to 25 kilometres per hour. We humans would get concussion or a headache very soon, but the head of the woodpecker is adapted to the movement - for example, it has special shock absorbers.

„Woodpeckers have very good neck muscles, similar to those of a boxer. And they have flexible, very elastic bones that buffer these shocks.“

What's more, the woodpecker's brain is surrounded by less fluid than that of a human. And that's also useful when he's banging away.

„During the impacts, it doesn't start to vibrate. And to protect itself from the flying wood chips, the bird always closes its eyes just before its beak hits the wood. That's important so that the eyes don't vibrate during the impacts, because that could also lead to headaches.“

woodpecker drumming

By the way, in the springtime, the drumming sounds are especially loud. That's because woodpeckers also drum to attract females, and to mark their territory!

drumroll

And now! A big drumroll, because we've reached our last audio point: The Hochablass or "high weir", a technological masterpiece that you're about to discover. See you there.

Audio Point 10: High Weir

Our last audio point is at the largest water-dispensing system in Augsburg, if not the world: the Hochablass. For more than half a millennium now, water at this location has been transferred from the Lech River to the canals of Augsburg. To get a better idea of how the system works - just stand next to the stone with the anchor lying on the lawn here - near the information board.

If you look upriver now, on your left you'll see the 145-meter-long wall that dams the Lech and, straight ahead, you'll see a long bridge - this is where the water flows off to the right, towards the city centre.

The people of Augsburg already had the idea of diverting the water from here during the Middle Ages. In the year 1346, the Hochablass was mentioned for the first time in documents, and today, when we look up the river, we can still understand why they chose this particular location back then. Nicolas Liebig:

„The Lech has a natural, narrow section here and thus a higher flow rate. You can see that the Lech comes around a bend here. In other words, the water bounces off this slope on the right - and that's the best opportunity to divert the water from here and direct it towards Augsburg.“

The name 'Hochablass' roughly means "high weir" - and the two stone figures next to the information board show us the reason for its importance.

On the left, you see a woman spinner, dressed in woven clothing, holding a spindle in her hand and sitting on a waterwheel. A symbol of the large textile factories that made Augsburg the 'Manchester of Germany' during the 19th century - primarily because of its hydropower.

„That was a advantage that no other city had. The companies came to Augsburg specifically because the city had such great opportunities to harness water power.“

The other figure, on the right, depicts a raftsman with ropes and a rafting pole - because, up until the year 1914, there was a large raft harbour here at the Hochablass.

water splashing, people calling

Up to 5000 rafts arrived every year - mainly with goods from Italy.

„Things must have been very busy here, and for many people, there must have been goods that were quite unknown to them. Silks from Venice, and an incredible variety of fragrant spices, all arriving here. It must have been fantastic.“

Because the Hochablass is so important for Augsburg, it was all the worse for the city when the site was destroyed - and that happened frequently during past centuries - partly as a result of enemies who first attacked it before moving on to the city, and partly due to several flood disasters, which completely tore away the dam ...

water flowing, dam tearing

... the most recent of those was in 1910. Afterwards, it was rebuilt with thick walls of reinforced concrete, which have held up to this day. To ensure that things stay that way, the facility is guarded around the clock - by three lock-keepers. They live with their families directly at the Hochablass in bungalows, and control the system completely by hand.

„The machine’s technology is actually the same as it was 100 years ago, and we’ve often thought about automating the whole thing, but everything is so complex, and adjusting it simply needs a lot of intuitive fine-tuning, so a human being is still required here to control the whole thing reliably.“

If you’d like to end your audio tour watching some world champions and Olympics winners during their training sessions, then the Hochablass is just the right place!

paddling, people calling

Because down on the right, below the bridge, is the canoe-slalom course of the 1972 Olympic Games. It was the first artificial canoe course in the world!

Below the canoe course there’s also a large historical building: namely, a waterworks, that pumped up drinking water from the ground and along pipes into the city during the 19th century. It contains technology that was unique for its time - and information on guided tours is available from the Augsburg Municipal Works, or Augsburger Stadtwerke.

And something else you should certainly go and visit is the textile and industrial museum in the city centre, the TIM. There, you can get a close-up look at the economic boom that water made possible here in Augsburg.

Have fun exploring - and enjoy the rest.

Directly to the Apple-iStore
or google-Play-Store

