



## CASE STUDY

### CUSTOMER

KAZAKHSTAN CENTER FOR MODERNIZATION AND DEVELOPMENT OF HOUSING AND PUBLIC UTILITIES

### LOCATION

AKTAU, KAZAKHSTAN / 2019

### EQUIPMENT

BOILER SYSTEMS

### APPLICATION

HEATING SYSTEM, DRINKING, AND PROCESS WATER

### PROVEN RESULTS



### SUCCESSFUL TEST:

0% IRON FOUND IN MUNICIPAL WATER AFTER FILTRATION

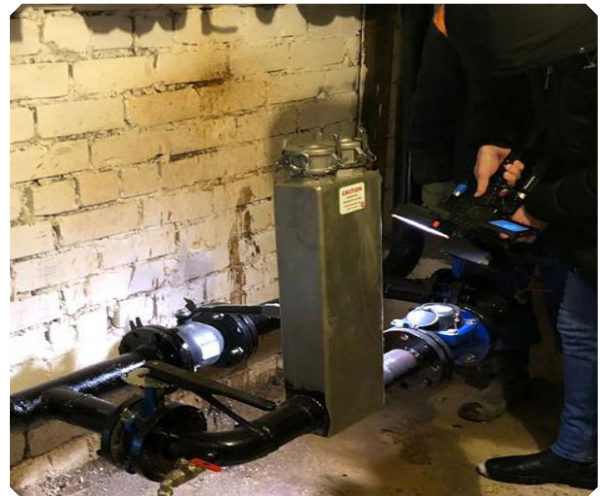
## CHALLENGE

Process water in Kazakhstan is used for citizens' day-to-day use, including drinking and bathing. Traditional filtration is unable to adequately clean the particulate under 10 microns causing corrosion build up in pipelines and reservoirs. The government's annual expenditure in operating costs for boiler management is in excess of \$100 million USD.

## SOLUTION

Test OEI magnetic filter scrubbers in various locations in the cities of Aktau and Uralsk to:

- » Reduce ferrous and non-ferrous contamination.
- » Improve boiler water and chiller water cleanliness.
- » Reduce conventional filter replacement.
- » Protect water system components from wear, contamination and corrosion.
- » Compare filtration efficiency against competitor magnetic filtration solutions.



WATER QUALITY BEFORE TEST



WATER QUALITY AFTER TEST



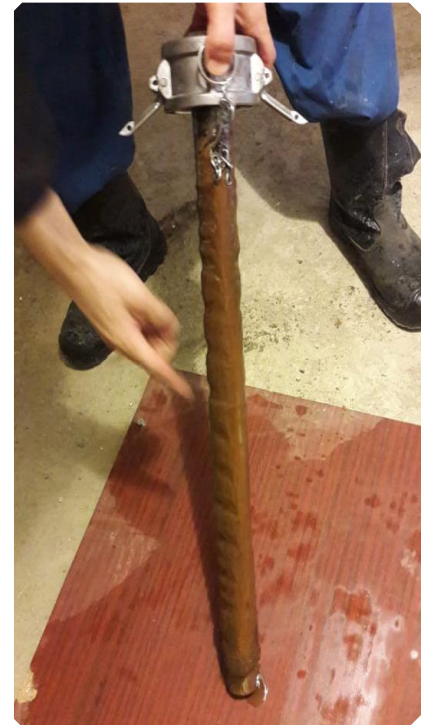
**PRODUCT RECOMMENDATION**  
**MAGNETIC FILTER SCRUBBER**



## RESULTS

The magnetic filters collected significant amounts of contamination that were for testing; analysis results demonstrated a dramatic decrease of iron, magnesium and other harmful elements.

The government of Kazakhstan is planning to install OEI magnetic filters statewide on major water infrastructure including pipelines, buildings, and other locations.



## ANALYSIS REPORT

**Испытательная лаборатория**  
**Товарищество с ограниченной ответственностью «Батыс су арнасы»**  
 Юридический адрес: Республика Казахстан, 090005, г. Уральск, улица Сырым Датова 4/4, тел: 8 (7122) 28-33-73  
 Фактический адрес: Саратовская трасса, 6 км, тел: 25-34-29  
 Аттестат аккредитации KZ.H.09.1715 от 05.04.2016г

**ПРОТОКОЛ № 35 от 16.04.2019г.**  
 Регистрационный № 1206, 1207

Заявитель: АО «Жайыктеплоэнерго»  
 Наименование пробы: вода питьевая  
 Место отбора пробы: ул. Мохамедов 101  
 Акт отбора: № 68 от 15.04.2019г.  
 Дата отбора пробы: 15.04.2019г.  
 Дата выполнения анализа: начало 15.04.2019г., окончание 16.04.2019г.  
 Наименование средств измерений: анализ 4100, сертификат № BK-09-2467 (действителен до 12.10.2019г.), спектрофотометр ПЭ-5400БИ, сертификат № BK-11-0071 (действителен до 12.10.2019г.), анализатор жесткости Флюорат 02-2М, сертификат № BK-09-2466 (действителен до 12.10.2019г.)  
 Условия проведения испытаний: температура 25,8 °С; влажность 65,0 %.

**Химические испытания**

Наименование определяемого ингредиента	ИД на методы испытаний	Единиц	Фактическая концентрация	
			до фильтра № 1206	после фильтра № 1207
Жесткость общая	ГОСТ 4151-72	моль/м³	5,9	5,7
Кальций	ГОСТ 23268.5-78	мг/дм³	76,15	70,14
Магний	ГОСТ 23268.5-78	мг/дм³	25,53	26,75
Хлориды	ГОСТ 4245-72	мг/дм³	124,0	124,0
Мутность	ГОСТ 3351-74	мг/дм³	1,24	1,18
Железо общее	ГОСТ 4011-72	мг/дм³	0,081	не обнаружено
pH	СТ РК ИСО 10523-2013	-	7,61	7,61

Инженер: *Е.А. Лытонова*  
 Зам. ИЛ: *А.Ж.Алекешова*

Testing laboratory  
 Limited liability partnership *Batys su arnasy*  
 Legal address: Republic of Kazakhstan, 090005, Uralsk, Str. Syrym Datov 4/4, tel: 8 (7122) 28-33-73  
 Business address: Saratovskaya highway, 6 km, tel: 25-34-29  
 Certificate of Accreditation KZ.H.09.1715 from 05.04.2016.

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Test protocol #35 from 16.04.2019,  
 Registration No. 1206, 1207

Submitter: *AO Zhayykteploenergo*  
 Testing sample: *drinking water*  
 Sampling site: *Molenkull str 101*  
 Sampling report: *No. 68 from 15.04.2019*  
 Sampling date: *15.04.2019*  
 Analysis date: *start 15.04.2019, end 16.04.2019*  
 Measuring tool: *ANION 4100 (pH analyzer) certificate No. BK-09-2467 (valid until 12.10.2019), spectrophotometer ПЭ-5400БИ certificate No. BK-11-0071 (valid until 12.10.2019), fluid analyzer Fluorat 02-2M certificate No. BK-09-2466 (valid until 12.10.2019)*  
 Testing conditions: *temperature 25.8 °C; humidity 65.0 %*

**Chemical test**

Identified component	Testing method reference document	Unit of measurement	Actual concentration	
			before the filter No. 1206	after the filter No. 1207
Total hardness	GOST 4151-72	mol/m³	5,9	5,7
Calcium	GOST 23268.5-78	mg/dm³	76,15	70,14
Magnesium	GOST 23268.5-78	mg/dm³	25,53	26,75
Chlorides	GOST 4245-72	mg/dm³	124,0	124,0
Turbidity	GOST 3351-74	mg/dm³	1,24	1,18
Total iron	GOST 4011-72	mg/dm³	0,081	Not found
pH	ST RK ISO 10523 - 2013	-	7,61	7,61

The protocol applies only to specimens subjected to testing.

Engineer: *E. A. Lytonina*  
 Testing laboratory supervisor: *A. Zh. Alekeshova*

Partial copying of the protocol without LLP Batys su arnasy's testing laboratory permission is prohibited.