



REPORT ON THE ENVIRONMENTAL IMPACT
OF JAVYS' OPERATION
IN **2013**





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1. INTRODUCTION

The Environmental report provides comprehensive information on air protection, water and waste management, the prevention of major industrial accidents, the handling of chemicals, the Environmental impact assessment process (EIA), as well as JAVYS' activities to protect the environment.

By maintaining the certified environmental management system of JAVYS under ISO 14001:2004 standard on Environmental Management Systems, the company's objective and mission to carry out all activities with regard to environmental protection has been demonstrated.

When fulfilling all activities, an emphasis is placed on the compliance with legal requirements identified from SR and EU legal regulations in individual areas of environmental protection, as well as the obligation to comply with the limits and conditions arising from the decisions of statutory and supervisory bodies in individual areas of environmental protection.

Environmental protection falls under the security process within the integrated management system.

2. AIR PROTECTION

Within air protection, JAVYS complies with basic legal regulation, being the National Council of SR Act No. 137/2010 Coll. on Air Protection as amended, as well as all referring acts, implementing regulations, and Slovak government resolutions.

The operation method of air pollution sources, from the source's approval, determination of the emission monitoring system, to the definition of limits to the discharged air pollutants are all determined by the valid decisions of statutory and supervisory bodies for environmental protection issued for JAVYS.

SOURCES OF AIR POLLUTION

JAVYS is an operator of air pollution sources in the categories: large, medium, and small sources.

Start-up and reserve boiler room (SuRBR)	large source
LOOS boiler in SuRBR	medium source
Gas boiler room	medium source, owned by JESS
BRWTC * incinerator	medium source
Infrared heater in the PFCC Trnava division	medium source
Diesel generator in the V1 fuel station division	medium source
Diesel generator in the PFCC Trnava division	small source
Diesel generator by the ISFS	small source
Gas appliances (boilers) in the PFCC Trnava division	small source
Production of fiber-concrete mixture in the PFCC Trnava division	small source

* JAVYS is operating a BRWTC incinerator of radioactive waste, which is however not categorized as a source of air pollution; it falls under nuclear facilities.

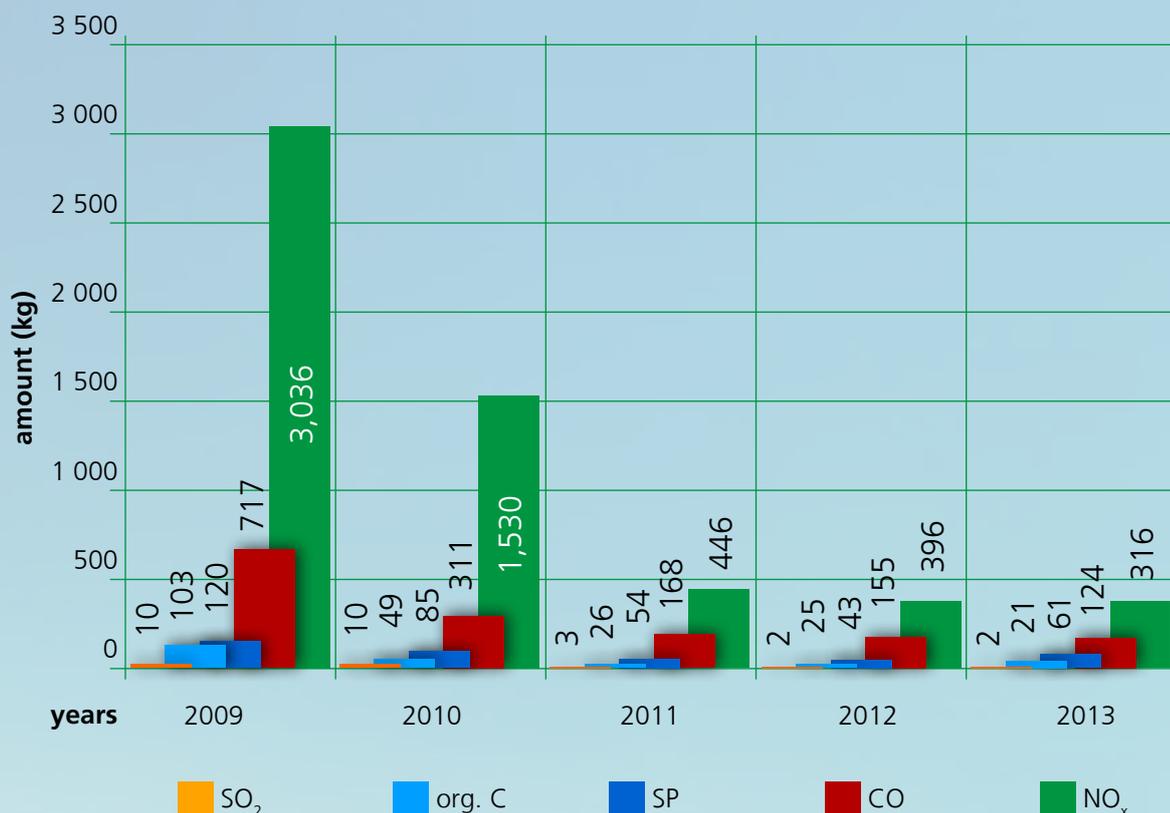
Amounts of discharged emissions from individual sources in 2013

Source	Fuel	Pollutant (kg)				
		SP	SO ₂	NO _x	CO	C _{org}
	Natural Gas (m ³)					
SuRBR	6, 699	0.508	0.060	11.202	3.754	0.477
LOOS boiler	131	0.009	0.001	0.193	0.078	0.013
Gas infra-red heaters	89, 715	6.818	0.818	132.957	53.694	8.949
Gas boiler room	97, 520	7.410	0.890	144.524	58.366	9.728
Gas appliances	11, 187	0.850	0.100	16.570	6.690	1.120
	Diesel (t)					
ISFS diesel generator	1.344	1.908	0.026	6.720	1.075	0.153
Diesel generator at the V1 fuel station	0.672	0.954	0.013	3.360	0.537	0.076

The diesel generator on the premises of the fiber-concrete container production is not in permanent operation. To verify the operation ability, 10 l of diesel was consumed during the one-hour test operation and 95 l of diesel during the stress tests.

The permission for the operation of fiber-concrete mixture production was issued by the Municipal Office in Trnava on 10 March 2010. In 2013, 490 fiber-concrete containers were produced, i.e. 2,107 t of fiber-concrete mixture, representing air pollution from solid pollutants in the amount of 0.04214 t.

Trends of pollutants emitted in the atmosphere from 2009 to 2013



Trends of pollutants emitted from the BRWTC incinerator from 2009 to 2013

Pollutant	2009 (kg)	2010 (kg)	2011 (kg)	2012 (kg)	2013 (kg)
HCl	2.00	1.05	0.54	23.84	0.55
HF	11.00	8.96	0.113	0.82	0.57
Hg + Tl + Cd	0.02	0.035	0.034	0.054	0.069
As + Ni + Cr + Co	0.30	0.43	0.33	0.29	0.372
Pb + Cu + Mn	0.08	0.157	0.205	0.24	0.307
SO ₂	5.00	6.11	4.05	107.00	29.36
NO _x	1,170.00	852.75	676.66	62.93	247.50
CO	93.00	78.38	57.93	17.17	35.73
SP	4.00	5.23	5.61	3.55	4.89
C _{org}	18.00	14.46	12.47	11.00	6.89
Operating hours	6,143.00	5,342.00	4,851.00	2,671.00	3,251.00

DEVICES CONTAINING FLUORINATED GREENHOUSE GASES

The devices listed in the table were reported to the Trnava and Bratislava District Offices. They are subject to the operational conditions under the Act No. 286/2009 Coll. on Fluorinated Greenhouse Gases, and the European Parliament and Council Decree (EC) No. 842/2006 on Certain Fluorinated Greenhouse Gases.

Devices with the content of fluorinated greenhouse gases beyond 3kg

Object	Device	Filling	Total volume (kg)	Number of items	Owner
External switchgears A1	compact switchgear 110 kV	SF ₆	186.0	2	JAVYS
External switchgears A1	measuring current transformer	SF ₆	24.0	6	JAVYS
External switchgears A1	measuring voltage transformer	SF ₆	26.4	6	JAVYS
Special washroom	air conditioning unit	R 410A	18.0	1	JAVYS
Administrative building V1	split unit	R 410A	4.2	1	JAVYS
Administrative building V1	split unit	R 410A	7.55	1	JAVYS
Administrative building V1	split unit	R 410A	7.55	1	JAVYS
Administrative building V1	split unit	R 410A	7.55	1	JAVYS
Administrative building V1	split unit	R 410A	7.55	1	JAVYS
Administrative building A1	air conditioning unit	R 410A	23.0	1	JAVYS
Administrative building A1	air conditioning unit	R 410A	23.0	1	JAVYS
Administrative building A1	air conditioning unit	R 410A	26.0	1	JAVYS
Administrative building A1	air conditioning unit	R 410A	22.0	1	JAVYS
Administrative building A1	air conditioning unit	R 410A	23.0	1	JAVYS
Administrative building A1	air conditioning unit	R 410A	3.4	1	JAVYS
AC Bratislava	air conditioning unit	R 410A	11.0	1	JAVYS
Medical center	air conditioning unit	R 410A	8.5	1	JESS
Administrative building	cooling unit	R 410A	2 x 23.0	2 cooling circuits	JESS
Administrative building	cooling unit	R 410A	2 x 23.0	2 cooling circuits	JESS
Administrative building V1	split unit	R 407C	3.2	1	JAVYS
Administrative building V1	split unit	R 407C	3.2	1	JAVYS
Administrative building V1	split unit	R 407C	4.3	1	JAVYS
Administrative building V1	split unit	R 407C	4.5	1	JAVYS
Administrative building V1	split unit	R 407C	3.1	1	JAVYS
Administrative building V1	split unit	R 407C	3.2	1	JAVYS
AC Bratislava	cooling unit	R 407C	22.0	1	JAVYS
AC Bratislava	VRV system	R 407C	11.2	1	JAVYS
AC Bratislava	VRV system	R 407C	6.3	1	JAVYS
AC Bratislava	VRV system	R 407C	6.4	1	JAVYS
AC Bratislava	VRV system	R 407C	11.2	1	JAVYS
AC Bratislava	VRV system	R 407C	11.2	1	JAVYS
AC Bratislava	VRV system	R 407C	11.8	1	JAVYS
Administrative building	cooling unit	R 407C	15.0	1	JESS

DISCHARGE OF RADIOACTIVE SUBSTANCES INTO THE ATMOSPHERE

Only a small percentage of the permitted limits for gaseous emissions and liquid discharges are emitted in the surrounding environment from JAVYS' nuclear facilities after multiple control measurements.

The objective of the limited emission values is to ensure that the summary discharge of radioactive substances into the environment from all sources in the location under both normal and specific operational conditions are set so, that due to the nuclear facility's operations, the annual radiation limit of 12 $\mu\text{Sv}/\text{year}$ for the RAW PTT, A1 NPP, and ISFS nuclear facilities will not be exceeded for individual residents, as well as 20 $\mu\text{Sv}/\text{year}$ for the V1 NPP nuclear facility due to radioactive emissions in the atmosphere and hydrosphere. Radioactive emissions in the atmosphere and hydrosphere are evaluated together.

Limit values for radioactive emissions in the air are stated in the LaC for each nuclear facility (RAW PTT, A1 NPP, ISFS, V1 NPP, FT RAW). They were laid down by the resolutions of the Slovak Public Health Authority and approved by the Slovak Nuclear Regulatory Authority.

Gaseous discharges of radioactive aerosols (β , γ) for 2013

Nuclear facility	Discharge activity	Annual limit	% of annual limit
VS 46A (MPB) aerosols	1,272.809 kBq	6.58×10^5 kBq	0.193
VS 46B (BL and OS) aerosols	216.576 kBq	1.41×10^5 kBq	0.154
VS 808 (BSC and OS) aerosols	254.618 kBq	1.41×10^5 kBq	0.181
VS 840 (ISFS) aerosols	266.342 kBq	3.00×10^5 kBq	0.089
V1 NPP aerosols	880.543 kBq	8.00×10^7 kBq	0.001
Aerosols from FT RAW	62.600 kBq	8.00×10^7 kBq	0.078

Gas from the FT RAW device is discharged into the SE-EMO chimney (not directly into the environment). In the SE-EMO facilities, the gas is re-filtered and subsequently discharged into the environment, along with the gas from SE-EMO.

No radioactive substances have been discharged into the atmosphere from the NRAWR premises given the repository's nature.

In 2013, the discharges from the JAVYS nuclear facilities into the atmosphere were deep below the authorized limits determined by the Slovak Public Health Office.

3. WATER MANAGEMENT

Within water protection, JAVYS complies with basic legal regulation, being the National Council of SR Act No. 364/2004 Coll. on Water as amended, as well as all directly and indirectly referring acts and implementing regulations, as amended.

Values of the permitted discharged waste water volumes, along with the concentration and balance limits for pollutants in waste water, location and method of waste water discharge, volume of collected surface water, etc., are determined by the valid decisions of statutory and supervisory bodies for water protection issued for JAVYS.

DRINKING WATER

For drinking and societal purposes, JAVYS utilizes the distribution of drinking water from Trnavská vodárenská spoločnosť, a.s. at the Jaslovské Bohunice site.

Operations at the Mochovce site – NRAWR and FT RAW utilize supply from the SE-EMO company as the source of drinking water.

The premises of the PFCC operation in Trnava are supplied with drinking water from the public water mains of Trnavská vodárenská spoločnosť, a.s., and the supply of drinking water for the administrative center in Bratislava is ensured from the public water mains of Bratislavská vodárenská spoločnosť, a.s.

Volume of drinking water consumed from 2010 to 2013

Location	Volume of drinking water (m ³)			
	2010	2011	2012	2013
Jaslovské Bohunice	165,673	176,550	147,897	81,279
NRAWR	243	194	266	254
FT RAW	288	250	215	220
VBK production plant	1,467	1,011	731	995
Bratislava administrative center	1,823	1,792	1,237	1,016
TOTAL	169,494	179,797	150,346	83,764

Total drinking water consumption in 2013 decreased by 66,582 m³ compared to the previous year, representing a reduction of consumption by 44.3%.

Analysis of drinking water samples

The quality of drinking water is controlled at JAVYS under Slovak Government Regulation No. 354/2006 Coll. as amended, laying down the requirements on water intended for human consumption, as well as the control of water quality intended for human consumption. In 2013, the accredited sampling and analyses of drinking water samples were carried out at the Jaslovské Bohunice and PFCC Trnava sites under valid contract. A test protocol was issued for each analysis, while in all cases the tested sample's evaluated indicators were in accordance with the limit values stated in GR No. 354/2006

COOLING WATER

The Jaslovské Bohunice Complex

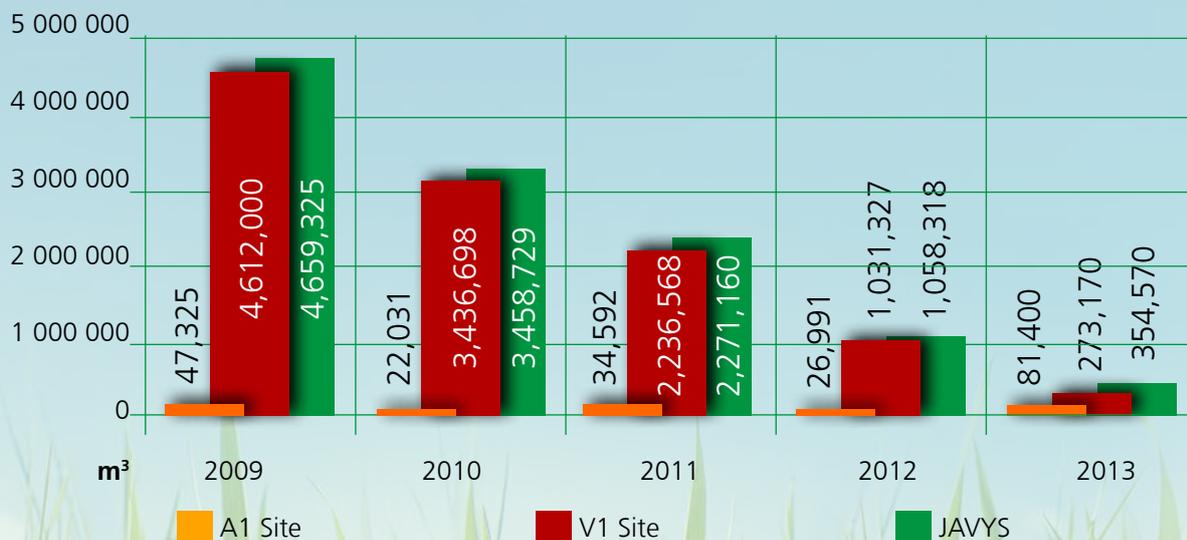
The Jaslovské Bohunice complex utilizes surface water from the Sĺňava reservoir as the source of cooling water. Its supplier is SE-EBO.

The surface (raw) "Váh River" water is used to cool the V1 NPP safety and emergency systems and the operations for the processing and storage of radioactive wastes. Until the end of 2009, the supplied water was filtered in the sand filters of the Pečeňady Pumping and Filtration Station. Since June 2012, the water has been filtered in the sand filters of the new V1 raw water filtration station. Since 2009 water consumption has had a downward trend.

Consumption of the cooling Váh River water from 2009 to 2013 (m³)

Year	V1 NPP, ISFS complex	A1 NPP, RAW PTT complex	JAVYS
2009	4,612,000	47,325	4,659,325
2010	3,436,698	22,031	3,458,729
2011	2,236,568	34,592	2,271,160
2012	1,031,327	26,991	1,058,318
2013	273,170	81,400	354,570

Consumption of the cooling Váh River water in (m³)



The consumption of cooling water in 2013 decreased by 703,748 m³ compared to 2012, representing a reduction of 66.5%.

The FT RAW Mochovce Complex

The FT RAW technological facilities (bitumen lines and thickening evaporator) are connected to the supply of non-essential technical water from the SE-EMO distribution system, i.e. the circulating cooling water. The consumption of cooling water from January to December 2013 recorded on the invoice measurement amounted to 15,938 m³. The volume activity of the FT RAW cooling water is continuously measured; in case of overrunning the set limit activity values, the technology is shut down until the source of activity is identified. Active cooling water is then pumped into the active waste water. In the monitored period no increased cooling water activity was recorded.

WASTE WATER

The Jaslovské Bohunice Complex

The JAVYS complex in Jaslovské Bohunice operates several sewer types:

- Rain water – empties into the Dudváh recipient through the Manivier open channel
- Sewage water – empties into the BIOCLAR sewage water treatment plant and then into the Váh through the SOCOMAN pipe collector
- Industrial – water polluted by crude oil products empty into the central gravitational oil separator; after purification the water is diverted for the treatment of additional cooling water through decanting in SE-EBO
- Special – flows into the collection tanks of special active water treatment plant for the given complex and following purification and inspection the waste water is discharged in an organized manner
- The final SOCOMAN sewer collector – diverts other waste water from technological facilities for the processing and treatment of RAW, including low-active waters to the Váh recipient

Balance of discharged waste water

Permission to discharge waste water No. KÚŽP-1/2006/00273/Fr (No. KÚŽP-1/2008/00582/GI) from the JAVYS Jaslovské Bohunice complex was issued by the Regional Environmental Office of Trnava with validity until 31 December 2010. The permission's validity was extended through decision KÚŽP-1/2010/00465/Mj until 31 December 2014 with amended permit conditions for the Váh recipient, as well as a determined condition to monitor the volume and quality of waste water discharged into the Dudváh recipient in the place of water emptying from the retention tanks. This condition was fulfilled in 2012 within an investment project (IPR IOOTSND60007) by building a new measuring area behind the retention tanks to measure and monitor the quality of waste water discharged into the Dudváh recipient (through the Manivier channel). These changes, as well as the changes to the allowed volumes of waste water discharged into the Dudváh River were permitted through REO resolution No. AF1/2012/461/Mj from 28 September 2012. Through resolution No. KÚŽP-1/2011/00451/GI, there was a change to the permitted limits for the activities of radionuclide discharged in waste waters from V1 NPP into the Váh and Dudváh rivers. In the mentioned resolution, the annual activity values of tritium discharged into the Váh and Dudváh rivers were decreased by one place value compared to the previous resolution in relation to V1 NPP's decommissioning.

The discharge of waste water through the SOCOMAN pipe collector and open Manivier channel was realized by JAVYS from January to 10 November 2013 in accordance with the valid resolutions of the state water administration bodies. After new resolution No. OU-TT-OSŽP2-2013/00026/GI, issued by the District Office in Trnava on 24 October 2013 entered into force, all previously issued decisions were cancelled. The new resolution became valid on 11 November 2013, and the validity period is until 31 October 2023.

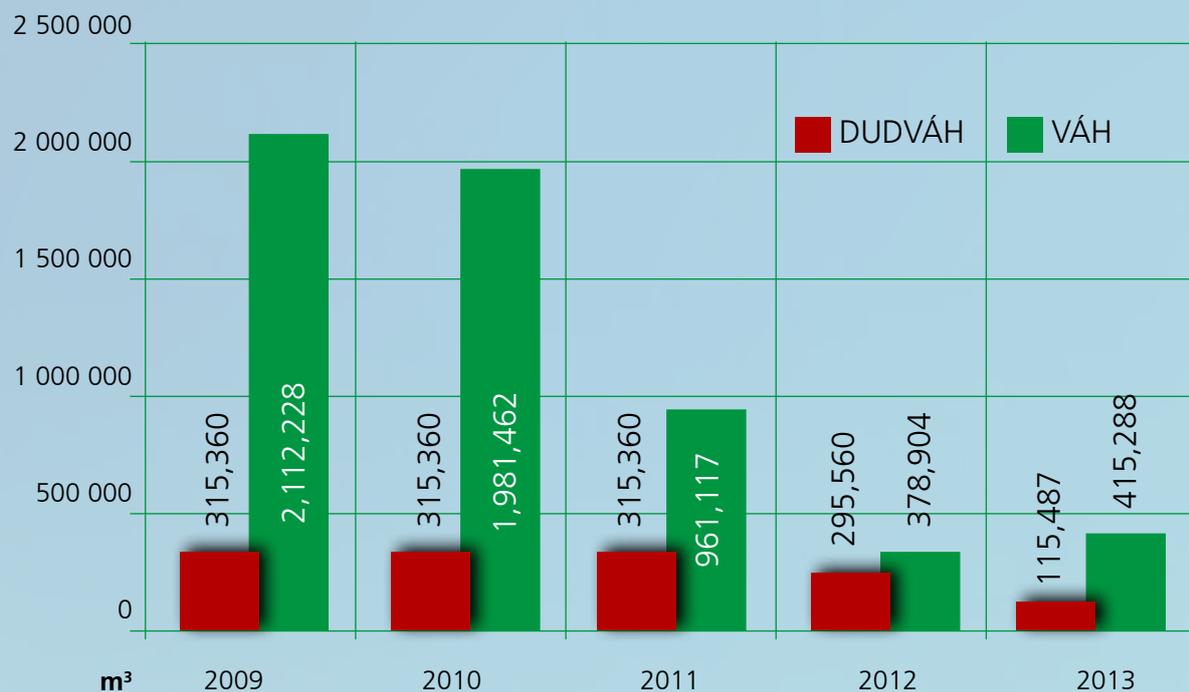
Water discharged from the JAVYS complex is monitored in terms of the CFP and ^3H volume activity, as well as chemical pollution indicators according to the requirements of resolutions issued for JAVYS.

In the monitored period no surpassed limits of pollutant indicators in waste water occurred.

Volume of discharged waste water into the Váh and Dudváh recipients from 2009 to 2013 (m³)

Recipient	2009	2010	2011	2012	2013
Váh	2,112,228	1,981,462	961,117	378,904	415,288
Dudváh	315,360	315,360	315,360	295,560	115,487

Volume of discharged waste water into the Váh and Dudváh recipients from 2009 to 2013



Average concentration of discharged chemical pollution into the Váh recipient

Chemical pollution indicators	Average concentration of released pollutants in 2013	Maximum permitted concentration (resolution KÚŽP-1/2006/00273/Fr, from 11.11.2013 new resolution OU-TT-OSŽP2-2013/00036/GI)
	mg/l	mg/l
Acidity, alkalinity - pH	8.074	9.00
Biochem. oxygen consumption – BSK ₅	1.534	8.00
Chem. oxygen consumption – CHSK _{Cr}	8.069	30.00
Insoluble substances – HS	15.000	20.00
Soluble substances – RL	401.722	1 000.00
Ammonia – N-NH ₄ ⁺	0.246	4.00
Nitrates – NO ₃ ⁻	25.888	50.00
Sulfates – SO ₄ ²⁻	26.831	150.00
Chlorides – Cl ⁻	23.328	100.00
Non-polar extract. substances – NEL	0.021	0.35
Total phosphates – P _{Total}	0.478	2.00
Iron - Fe	0.071	2.00
Hydrazine hydrate – N ₂ H ₄	0.000	not determined
Detergents – PAL	0.050	0.50

Average concentration of discharged chemical pollution into the Dudváh recipient

Chemical pollution indicators	Average concentration of released pollutants in 2013	Maximum permitted concentration (resolution KÚŽP-1/2006/00273/ Fr, from 11.11.2013 new resolution OU-TT-OSŽP2-2013/00036/GI)
	mg/l	mg/l
Acidity, alkalinity - pH	8.500	9.00
Chem. oxygen consumption – CHSK _{Cr}	16.917	30.00
Insoluble substances - HS	15.000	40.00
Soluble substances - RL	233.667	1,000.00
Sulfates – SO ₄ ²⁻	23.967	150.00
Chlorides – Cl ⁻	14.840	100.00
Non-polar extract. substances - NEL	0.021	0.35
Total phosphates – P _{Total}	0.235	2.00
Iron - Fe	0.367	2.00
Hydrazine hydrate – N ₂ H ₄	<0.022*	2.00

* The N₂H₄ indicator value is below the limit of the measuring device's detection using the method of atomic emission spectrometry with inductively coupled plasma. N₂H₄ is not discharged into waste water; since the second half of 2010 it has not been used in the JAVYS complex. The new resolution on waste water discharge No. OU-TT-OSŽP2-2013/00036/GI issued by DO Trnava does not determine the obligation to measure N₂H₄.

The NRAWR Mochovce Complex

In the NRAWR Mochovce complex, there is rainwater drainage emptying into the Telince Stream through rainwater tanks.

Through Resolution No. OOZPŽ/6573/2011, the Chief Hygienist of the SR issued a permit for JAVYS to perform activities leading to radiation. It also includes the activity limits of radionuclides discharged into water from the NRAWR Mochovce surface runoff. The resolution on the discharge from the surface runoff was issued by the Regional Office in Nitra, Department of Environment. In 2013, 7,491 m³ of water was discharged from the NRAWR surface runoff into the Telince stream.

The FT RAW Mochovce Complex

Waste water from FT RAW is channelled into the SE-EMO sewage system; from there into the waste water treatment plant, and after purification, it is discharged into the environment along with the SE-EMO water.

The volume of rainwater is calculated from the total area of FT RAW roofs and the average annual precipitation (1.7 mm/day). Rainwater is also discharged into the SE-EMO rainwater drainage along with the rainwater from other SE-EMO structures. Rainwater is collected in retention tanks and after the measurements it's discharged into the environment.

The disposal of waste and rain water is ensured by Slovenské elektrárne.

DISCHARGE OF RADIOACTIVE SUBSTANCES INTO THE HYDROSPHERE

From its nuclear facilities, JAVYS discharges only a small percentage of the permitted limits for liquid discharges into the environment after multiple control measurements.

The objective of the limited emission values is to ensure that the summary discharge of radioactive substances into the environment from all sources at the Jaslovské Bohunice site, under both normal and specific operational conditions, are set so that due to the nuclear facility's operations, the annual radiation limit of 12 $\mu\text{Sv}/\text{year}$ for the RAW PTT, A1 NPP, and ISFS nuclear facilities will not be exceeded for individual residents, as well as 20 $\mu\text{Sv}/\text{year}$ for the V1 NPP nuclear facility due to radioactive emissions in the atmosphere and hydrosphere. The radioactive emissions in the atmosphere and hydrosphere are evaluated together.

The limits of radioactive discharges into surface waters are stated in the LaC for the JAVYS nuclear facilities (RAW PTT, A1 NPP, ISFS, V1 NPP, NRAWR and FT RAW). They were set through the decisions of PHA SR and approved by the Slovak Nuclear Regulatory Authority.

The control of discharged activities in waste water is performed through the measurements of tritium's volume activity, as well as corrosion and fission products, and the water volumes in the RAW PTT, A1 NPP, ISFS, and V1 NPP collection tanks, while the water discharge is also controlled through continuous monitoring in the measuring objects. Low-active waters also include waters discharged from the standard operation rescue pumping of groundwater from the N-3 (SO 106) borehole, for which a permission from DO Trnava was issued under Act No. 364/2004 Coll. on Water.

Discharge of low-active water from the Jaslovské Bohunice site (including water from the rescue pumping from the RAW PTT and A1 NPP complexes) into the Váh recipient

2013	Radionuclide activities in the Váh recipient waste water							
	V1 NPP, ISFS Complexes				A1 NPP, RAW PTT Complexes			
	CFP (MBq)	tritium (GBq)	% pumping the CFP limit*	% pumping the ^3H limit*	CFP (MBq)	tritium (GBq)	% pumping the CFP limit**	% pumping the ^3H limit**
Total	17.330	12.254	0.133	0.613	72.445	110.654	0.603	1.107

* the CFP limit is 13,000 MBq; the tritium limit is 2,000 GBq (since 20. 7. 2011)

** the CFP limit is 12,000 MBq; the tritium limit is 10,000 GBq

Discharge of low-active water from the Jaslovské Bohunice site into the Dudváh recipient

Do recipientu Dudváh neboli v roku 2013 vypúšťané žiadne nízkoaktívne vody.

Active discharges into the hydrosphere from NRAWR and FT RAW

Only waters from the surface runoff are discharged into NRAWR, and the limits of discharged water indicators were not exceeded in the monitored period. The measured values (^3H , ^{60}Co , ^{137}Cs , ^{90}Sr , $^{239+240}\text{Pu}$) fluctuated at the detection limit levels.

Water at the volume of 7,491 m^3 and with a total activity of 20.25×10^6 Bq was discharged into the hydrosphere, i.e. the Telince stream.

The table shows the percentage evaluation of the total individual radionuclide activity in 7,491 m^3 of the discharged volume from the surface runoff into LaC. The volume activity limits of radionuclides in the discharged water determined in the resolution of the Chief Hygienist were not exceeded in any indicator during the monitored period.

Data on the quality of the discharged rain and waste water from NRAWR

Radionuclide	Discharge activity (Bq)	Annual limit (Bq)	% of the annual limit
^3H	1.87×10^7	1.88×10^{10}	0.100
^{137}Cs	1.40×10^6	2.28×10^7	6.150
^{60}Co	8.15×10^5	2.24×10^7	3.640
^{90}Sr	5.70×10^5	2.44×10^8	0.231
^{239}Pu	2.40×10^4	5.56×10^5	4.264

In the FT RAW facility, two types of secondary active liquid wastes are produced. These active media (waste water, vapor condensate) are not released into the environment (active releases) but are pumped into the SE-EMO system for further treatment.

Data on the quality of the discharged active secondary waste water from FT RAW into SE-EMO

Radionuclide	Waste water $V = 104.05 \text{ m}^3$	Vapor condensate $V = 169.43 \text{ m}^3$	Activity volume	Annual Bq limit	% of the limit
Tritium (Bq)	2.85×10^9	2.89×10^{10}	3.18×10^{10}	3.0×10^{11}	10.61
Corrosion and fission products (Bq)	5.71×10^8	8.78×10^8	1.45×10^9	3.9×10^9	37.16

Note: Waste water and vapor condensate are purified in SE-EMO, i.e. contributions in the environmental discharges are even lower.

In 2013, JAVYS did not exceed the limit for the tritium activity in the discharged water and the discharges of corrosion and fission products in waste water were below the set authorized limits.

MONITORING AND PROTECTION OF GROUNDWATER

The Jaslovské Bohunice Complex

The monitoring and protection of ground and soil water in the Jaslovské Bohunice complex and its vicinity has been conducted since 1997 according to the approved monitoring program. The long and regularly monitored radiation situation in RAW PTT and A1 NPP groundwaters is currently stabilized.

Since 2000, a system of continuous rescue pumping in the complex has been in operation. Within the project of A1 NPP's decommissioning, activities that gradually eliminated the primary sources of soil and groundwater contamination are being executed.

To assess the efficiency and suitability of the realized groundwater rescue pumping (the N-3 borehole), an independent study called "The Need for Rescue Pumping in the A1 NPP Complex" was prepared, recommending persistence in the continuous groundwater rescue pumping without changes in the rescue process.

Standard operation evaluation of groundwater rescue pumping from the N-3 borehole

Rescue pumping in 2013	Exhausted CFP activity (MBq)	Exhaustion of the CFP limit* (%)	Exhausted tritium activity (GBq)	Exhaustion of the ³ H limit* (%)	Volume of pumped water (m ³)
Total	3.260	0.027	60.990	0.610	194,058.60

* the "limit exhaustion" values are set in the resolution, the CFP limit = 1.2×10^4 MBq, the ³H limit = 1.0×10^4 GBq Bq

In addition to monitoring within the company premises, monitoring of the surroundings is performed. Based on the groundwater monitoring results around the Jaslovské Bohunice complex, it's possible to observe significant improvement in the radiation situation (the decrease in the level of tritium volume activities to an insignificant level reaching the level of the natural background) around the towns of Malženice and Žlkovce.

The NRAWR Mochovce Complex

There are 52 monitoring boreholes (groundwater) in the NRAWR complex and its vicinity, from which samples were taken according to the valid 2013 schedule and subsequently chemical and radiochemical analyses were carried out.

In addition to groundwater, NRAWR also monitors drainage water in which the volume activity of the individual radionuclides in 2013 fluctuated below the limit set by the Chief Hygienist of the SR in Resolution No. OOPŽ/6573/2011.

The drainage water is discharged through rainwater tanks and its volume and analyses are included in the discharged water.

Results of chemical and biochemical water analyses

Measured	Activity value (Bq/l)
³ H	< 5
total beta activity	< 1
¹³⁷ Cs	< 0.80
⁶⁰ Co	< 0.90
⁹⁰ Sr	< 2
²³⁹ Pu	< 0.06

Results of radiochemical measurements are in the background level and no negative impact on the environment in the NRAWR complex and its vicinity occurred during the operation.

4. WASTE MANAGEMENT (INACTIVE WASTES)

In waste management (inactive wastes), JAVYS complies with basic legal regulation: National Council of the SR Act No. 223/2001 Coll. on Waste as amended, and all referring acts and implementing regulations as amended.

The Jaslovské Bohunice Complex

Waste management is ensured through collection, separation, and storing in the area reserved for these purposes – the Waste Collection Yard. The hazardous waste is temporarily stored on suitable and technologically secured premises prior to their final disposal in order to prevent their negative impact or danger to life and health of people, property, and the environment.

The storage of the produced waste is directly and indirectly derived from the activities related to JAVYS' subject of business.

In 2013, JAVYS produced wastes in the categories: other (O) and hazardous (H) according to the waste catalogue (ME SR Decree No. 284/2001 Coll.), as well as communal and biodegradable waste.

Volume and type of other wastes produced in 2013

Catalogue no.	Waste type	Name of waste	Volume (kg)	Assessed (kg)	Disposed (kg)
080318	O	Waste printing toner other than stated in 080317	940		✓
150101	O	Mixed paper	1,980	✓	
150102	O	PET plastic packaging	310	✓	
160214	O	Discarded equipment - measuring devices	10,200	✓	
170101	O	Concrete	11,660		✓
170201	O	Wood	4,260		✓
170302	O	Bituminous mixtures other than 170301	53,220		✓
170402	O	Aluminium	830	✓	
170401	O	Copper, bronze, brass	470	✓	
170405	O	Iron and steel (stainless)	12,050	✓	
170407	O	Scrap metal	319,550	✓	
170604	O	Insulation materials other than in 170601 and 03	73,510		✓
170411	O	Aluminium cables	210	✓	
Total volume (kg)			489,190	345,600	143,590
Total volume (%)			100 %	70.65 %	29.35 %

Volume and type of hazardous waste produced in 2013

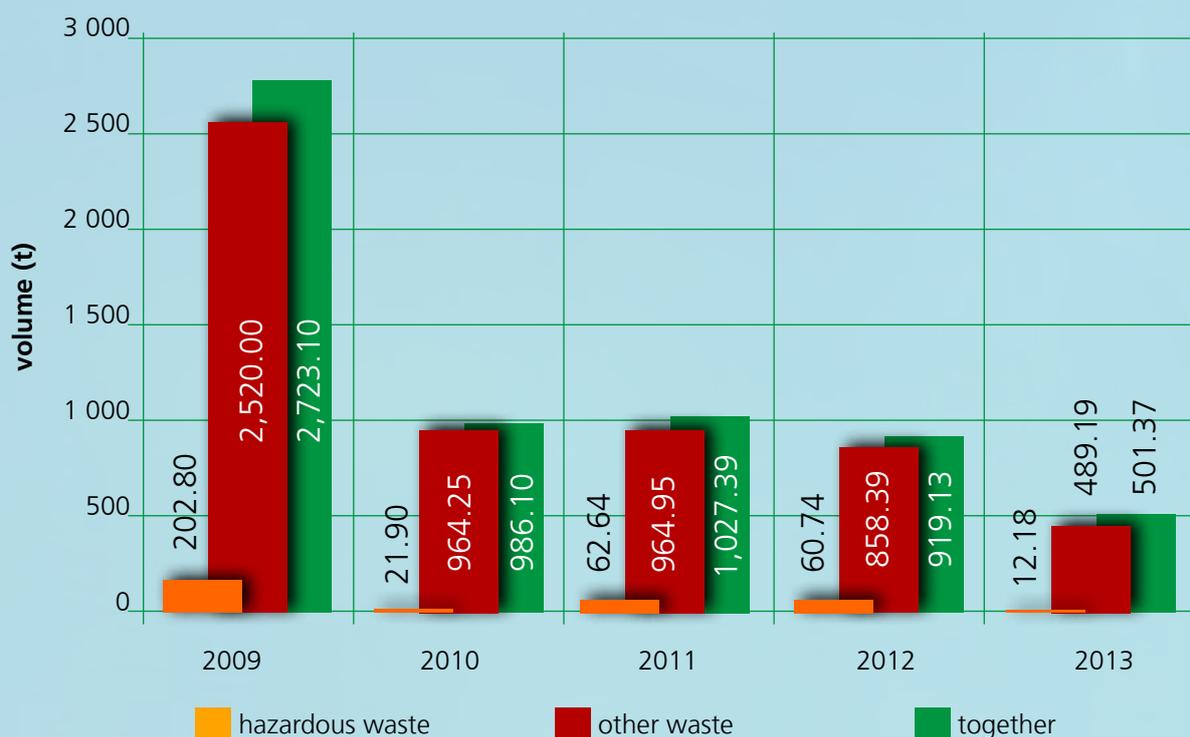
Catalogue no.	Waste type	Name of waste	Volume (kg)	Assessed (kg)	Disposed (kg)
080111	H	Waste paint and varnish containing organic solvents or other HS	2,180	✓	
080317	H	Waste toner	80		✓
080409	H	Waste adhesives and sealants	420	✓	
090104	H	Fixer solutions	1,230		✓
130113	H	Other hydraulic oils	180	✓	
150110	H	Packages containing HS	990	✓	
150202	H	Absorbents, filters, cleaning cloths	40	✓	
160213	H	Discarded devices containing DP - fluorescent tubes	280	✓	
160601	H	Lead batteries	6,780	✓	
Total volume (kg)			12,180	10,870	1,310
Total volume (%)			100 %	89.25 %	10.75 %

Compared to 2012, the total volume of other produced waste is **369.2t** lower, and the volume of produced hazardous wastes was **48.6t** lower.

Volume of communal and biodegradable waste produced in 2013

Catalogue no.	Waste type	Name of waste	Volume (kg)	Assessed (kg)	Disposed (kg)
200301	O	Mixed communal waste	39,880		✓
200201	O	Biodegradable waste	69,600	✓	
Total volume (kg)			109,480	69,600	39,880
Total volume (%)			100 %	63.57 %	36.43 %

Volume of other and hazardous waste produced in 2009 to 2013



Waste disposal and assessment is ensured by companies with the respective licenses and the authorization to handle the individual waste types. The disposal of communal waste is carried out through towns in the respective locations (Trnava, Bratislava, Jaslovské Bohunice) in accordance with generally binding municipal regulations.

The Mochovce Complex

In the Mochovce complex, mixed communal waste at a total volume of 0.294 t and waste from cleaning cesspools at a volume of 60 m³ was produced in NRAWR and FT RAW.

Export and waste disposal from the Mochovce complex is ensured through the service provider, SE-EMO.

Inspections

Through its permanent office in Nitra, the Slovak Environmental Inspectorate carried out an inspection along with the Trnava State Energy Inspectorate's Regional Inspectorate focused on compliance with the obligations of the polychlorinated biphenyls (PCB) holder arising from Paragraph 40a of Act No. 223/2001 Coll. on Waste in the period from 20 August to 14 October 2013.

At the Jaslovské Bohunice site, JAVYS holds 14 registered functional measuring voltage and current transformers, out of which 4 measuring current transformers are not contaminated with PCB based on the producer's statement. With the other 9 measuring voltage transformers, it is not technically possible to take a sample for oil analysis during the operation, and thus it was not possible to test the device for the presence of PCB content. The Slovak Environmental Inspectorate gave permission to decommission the transformers by 31 December 2015. Based on the oil analysis results in the transformers for the presence of PCB performed after this date, 9 measuring voltage transformers will be decontaminated and disposed of in accordance with the law. The inspection of compliance with PCB obligations at JAVYS did not reveal any violation of the PCB holder obligations arising from Paragraph 40a of the Act on Waste.

5. MAJOR INDUSTRIAL ACCIDENTS

Within the prevention of major industrial accidents, JAVYS complies with basic legal regulation, being National Council of SR Act No. 261/2002 Coll. on the Prevention of Major Industrial Accidents as amended, as well as all referring acts and implementing regulations as amended.

Categorization of JAVYS in Terms of Valid MIA Legislation

Since 2011, Jadrová a vyrad'ovacia spoločnosť, a.s. has been excluded from the "A" category based on the volume of selected hazardous substances in the complex according to Paragraph 5 of Act No. 261/2002 Coll. on the Prevention of Major Industrial Accidents and the amendment and supplementation to certain laws.

Even after its exclusion from the "A" category, the company is obliged to regularly continue monitoring the volumes, fire characteristics, and type of selected hazardous substances in the company under Act No. 261/2002 Coll., and in case of a need for reclassification, send a new notification to the DO.

6. HANDLING OF CHEMICAL SUBSTANCES AND MIXTURES

To monitor the handling of chemicals, JAVYS uses the Management of Chemical Substances (MCS) application. The application contains a classifier of all chemical substances and mixtures purchased and used in the company. All chemical substances and mixtures are categorized according to the law on chemicals, water, and the prevention of major industrial accidents.

Under Act No. 67/2010 Coll. (law on chemicals) and related European Parliament and Council (EC) Decree No. 1272/2008 (CLP) on the Classification, Labelling, and Packaging of Substances and Mixtures, JAVYS was required to conduct a new classification of chemical substances based on new security data sheets as the subsequent user of chemical substances and mixtures.

At the beginning of 2013, a change in the classification of chemical substances was performed in the MCS application, thus fulfilling the legislative requirements in this area. A new classification of chemical mixtures will be performed by 1 June 2017 according to the act.

7. ENVIRONMENTAL IMPACT ASSESSMENT UNDER ACT NO. 24/2006 COLL.

Within environmental impact assessment, JAVYS complies with basic legal regulation, being National Council of SR Act No. 24/2006 Coll. on Environmental Impact Assessment and the amendments and supplementations to certain laws as amended. Pursuant to this act's requirements, the environmental impact assessment processes are being conducted concerning the new proposed activities categorized according to Appendix 8 of the act, as well as the evaluation of changes to the existing activities based on the Report on the Proposed Activity's Change.

Environmental Impacts Assessment Processes

The Jaslovské Bohunice Site

In the Jaslovské Bohunice site, several BIDSF projects concerning environmental impact assessment were in various process stages in 2013: C7-A3 Construction of a New Large-Capacity Fragmentation and Decontamination Facility for V1 NPP; C7-A4 Metallic RAW Melting Capacity at the Jaslovské Bohunice Site; and B6.7 The Environmental Impact Assessment Report of the Second Stage of V1 NPP's Decommissioning. The statutory assessment process included the activity of the RAW PTT nuclear facility called The Assessment of Existing RAW Processing and Treatment Technologies.

In 2013, ME SR issued the final statement for the newly proposed activity – project C7-A2 Increasing the Capacity of Existing Fragmentation and Decontamination Facilities, and DEO Trnava issued a decision under the investigation procedure concerning the further non-evaluation of project BIDSF C16.1 Conditioning of Buffer Storage Areas.

The Mochovce Site

At the JAVYS Mochovce Site, the existing Final Processing of Liquid RAW activity was in various process stages of environmental impact assessment in 2013.

ME SR issued a final statement for the existing activity Expansion of NRAWR in Mochovce for the storage of low-active wastes and the construction of a low-active waste storage.

Detailed information on the environmental impact assessment processes is published on the JAVYS website and the EIA/SEA information system.

8. ENVIRONMENTAL MANAGEMENT SYSTEM

One of the progressive JAVYS management tools in terms of environmental protection is the Environmental Management System (EMS) implemented and certified under standard ISO 14001:2004 Environmental Management Systems. Requirements with Guidance for Use. Environmental policy and company objectives are directed to the continuous improvement of environmental behaviour and compliance with a commitment to pollution prevention.

Since the company's establishment in 2006, JAVYS has been successfully meeting the conditions of the stated standard in a full scope as demonstrated by the DNV audits and documented by the Environmental Management System Certificate. Periodic and rectification audits confirm the fact that JAVYS is a licit holder of the EMS Certificate.

During the periodic audit carried out on 4-6 November 2013, the DNV auditors verified the applied integrated management system, including the environmental management system's compliance with the requirements of standard ISO 14001. JAVYS has repeatedly ensured the validity of its EMS Certificate for the decommissioning of nuclear facilities and the management of radioactive wastes and spent nuclear fuel. A strong indicator of the implemented and maintained EMS system's improved efficiency at JAVYS is the zero number of nonconformities identified during the periodic audit.

ABBREVIATIONS

AC	Administrative Center
As	arsenic
A1 NPP	A1 Nuclear Power Plant
BIDSF	Bohunice International Decommissioning Support Fund
BL	bituminisation facility
Bq	Becquerel
BRWTC	Bohunice Radioactive Waste Treatment Center
C_{org.}	organic carbon
Cd	cadmium
CFP	corrosion and fission products
CO	carbon monoxide
Co	cobalt
Cr	chrome
Cs	caesium
Cu	copper
DEO	District Environmental Office
DO	District Office
E	environment
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EU	European Union
FT RAW	Liquid RAW Final Treatment Facility
GBq	gigabecquerel
GR SR	Slovak Government Resolution
³H	tritium
HCl	hydrogen chloride
HF	hydrogen fluoride
Hg	mercury
HS	hazardous substance
ISFS	Interim Spent Fuel Storage

JAVYS	Jadrová a vyrad'ovacia spoločnosť, a.s.
JESS	Jadrová energetická spoločnosť Slovenska, a.s.
LaC	Limits and Conditions
MBq	megabecquerel
MCS	management of chemical substances
ME SR	Ministry of Environment of the Slovak Republic
MIA	major industrial accidents
Mn	manganese
NF	nuclear facility
Ni	nickel
NOx	nitrogen oxides
NRAWR	The National Radioactive Waste Repository
OS	outdoor structures
Pb	lead
PFCC	production of fibre-concrete containers
PHA SR	Public Health Authority of the Slovak Republic
P_{Total}	total phosphorus
Pu	plutonium
RAW	radioactive wastes
RAW PTT	Radioactive Waste Processing and Treatment Technology
REO	Regional Environmental Office
SE-EBO	Slovenské elektrárne, a.s., Atómové elektrárne Bohunice plant
SE-EMO	Slovenské elektrárne, a.s., Atómové elektrárne Mochovce plant
SO₂	sulphur dioxide
SP	solid pollutants
Sr	strontium
SuRBR	start-up and reserve boiler room
TI	thallium
VS	ventilation stack
V1 NPP	V1 Nuclear Power Plant



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