

## **RADIOACTIVE WASTE MANAGEMENT PROGRAMMES IN OECD/NEA MEMBER COUNTRIES**

### **SWITZERLAND [2011]**

#### **NATIONAL NUCLEAR ENERGY CONTEXT**

Commercial use of nuclear power in Switzerland began in 1969 and, by 1984, 5 nuclear power units were connected to the electricity grid. Together, they generate approximately 25 TWh of electricity each year, i.e. around 40% of the total electricity produced.

Additionally, in June 2008 a general licence application was submitted for a new nuclear power plant (NPP) near the site of the Gösgen NPP. Further general licence applications to replace the older NPPs of Beznau and Mühleberg were submitted in December 2008. On 14 March 2011 however, the head of the *Federal Department of the Environment, Transport, Energy and Communications* (DETEC) suspended the licensing procedure for new NPPs. On 25 May 2011, the Federal Council (federal government) decided to gradually phase out nuclear energy as part of its new energy strategy. Existing nuclear power plants should be decommissioned at the end of their operational lifespan and not be replaced by new nuclear power plants.

A new Nuclear Energy Act was approved by Parliament in March 2003 and came into force in 2005. Its main provisions are:

- No limitation on the operating lifetime of the NPPs, other than on the basis of safety considerations.
- An optional national referendum for the general licence for new nuclear facilities (including radioactive waste repositories).
- A 10-year moratorium on reprocessing of spent fuel, beginning in July 2006.
- Responsibility of the waste producers for the management and disposal of their waste.
- Responsibility of the Federal State for the management of radioactive waste arising from medicine, industry and research.
- Disposal of all radioactive waste in deep geological repositories.
- Broad consultation within the framework of the site selection process.
- Securing the necessary financial resources in two independent funds for nuclear facility decommissioning and waste disposal.

According to the new legislation, radioactive waste disposal is expected, in principle, to take place in Switzerland, although disposal within the framework of a multinational project may be allowed as an exception, provided strict conditions are fulfilled.

## **SOURCES, TYPES AND QUANTITIES OF WASTE**

### **WASTE management concept**

The nuclear waste management concept in Switzerland envisages two repositories, one for low- and intermediate-level waste (L/ILW) and the other for spent fuel (SF), high-level waste (HLW) and long-lived intermediate-level waste (ILW).

For planning purposes, a model waste inventory (MIRAM) of all existing waste as well as all expected or projected waste arising has been developed and is periodically updated. In addition, the operators of the NPPs and waste management facilities, together with the *National Cooperative for the Disposal of Radioactive Waste (Nagra)*, have developed an electronic database, ISRAM, which includes a detailed description of all waste packages and their contents and thus provides a complete and detailed account of the radioactive wastes currently existing in Switzerland.

### **WASTE volumes**

The majority of radioactive waste arising in Switzerland comes from nuclear electricity production; a more detailed breakdown of the expected and projected arising of the different waste types can be found below. These are based on the model inventory of all radioactive wastes estimated to arise from a 50-year operating lifetime for the existing NPPs and from their subsequent decommissioning. The waste volumes from medicine, industry and research assume a period of collection up to 2050.

The values given below are for the wastes packaged in disposal containers ready for placement in the repositories; the values in brackets are the volumes of conditioned wastes, as delivered to the disposal facility, before packaging into disposal containers.

### **Low- and intermediate-level waste**

The waste to be disposed of in the L/ILW repository consists of operational waste from the NPPs, waste from medicine, industry and research and waste from the decommissioning and dismantling of the NPPs and nuclear research facilities. According to current estimates, the total volume (rounded) of waste for the L/ILW repository will amount to 87,000 m<sup>3</sup> (64,000 m<sup>3</sup>) for the existing NPPs with an assumed operation time of 50 years and a collection period of the waste from medicine, industry and research until 2050 (volume of conditioned waste and packaged into disposal containers; in brackets volume of conditioned waste). Of this, 32,000 m<sup>3</sup> (27,000 m<sup>3</sup>) is operational and decommissioning wastes from medicine, industry and research (this figure includes a reserve of 12,000 m<sup>3</sup> mainly to cover wastes from large research facilities), 26,000 m<sup>3</sup> (7,600

m<sup>3</sup>) represent operational waste from the NPPs (including exchangeable reactor internals such as control rods, etc.) and 29,000 m<sup>3</sup> (29,000 m<sup>3</sup>) are expected from the decommissioning of the five existing NPPs and the waste treatment installations (e.g. plasma incinerator) at the ZWILAG centralised interim storage facility.

### **Spent fuel, high-level and long-lived intermediate-level wastes**

A total of around 3,575 tonnes HM of spent fuel is expected from the five reactors currently in operation, assuming a 50-year operating lifetime. The contracts between the Swiss NPP operators and reprocessing companies in France and the United Kingdom cover approximately 1,200 tonnes IHM of spent fuel. For planning purposes, this is assumed to be the total amount that will be reprocessed although, in principle, reprocessing may be resumed after the current moratorium has expired. This scenario will result in 6,595 m<sup>3</sup> (1,135 m<sup>3</sup>) of spent fuel elements (encapsulated in disposal containers) and about 730 m<sup>3</sup> (115 m<sup>3</sup>) of vitrified high-level waste to be disposed of in the HLW-repository. Furthermore, also long-lived ILW will be disposed of in the HLW-repository. This includes mainly wastes from reprocessing. Furthermore, also the waste arising from the operation of the HLW-repository and the encapsulation plant will be disposed of together with the long-lived ILW resulting in an overall volume of approx. 5,000 m<sup>3</sup>.

## **RADIOACTIVE WASTE MANAGEMENT POLICIES AND PROGRAMMES**

### **WASTE management policies**

In 2003, Parliament decided to introduce a 10-year moratorium on the export of spent fuel for reprocessing which started in July 2006. Before the start of the moratorium, the utilities were free to choose between reprocessing and direct disposal of the spent fuel. The fate of spent fuel currently stored is not fixed. Depending on the future evolution of the use of nuclear energy and on the political decision on the prolongation of the above moratorium, the owners of spent fuel may decide to reprocess it at a later date, or to dispose of it as waste.

The disposal of radioactive waste is based on the concept of “monitored long-term geological disposal” defined by an expert group in the year 2000 and whose provisions were subsequently included in the nuclear energy legislation. This concept lays particular emphasis on features and organisational measures that allow monitoring and control of the facility. Following a long observation phase, the underground repository of radioactive waste will finally be sealed and placed under the authority of the state.

Switzerland's disposal concept foresees two deep geological repositories: one for low and intermediate level waste and one for high-level waste. For both waste categories it would also be possible to construct and operate two deep geological repositories at the same site, as long as this is safe and technically feasible. Because of the necessary cooling time prior to disposal, the repository for SF/HLW will not be needed for several decades. The option of disposing of waste abroad within the framework of a bilateral or multilateral project is kept open, but not actively pursued.

Since no repository is available as yet, all radioactive waste is currently transferred to interim storage

facilities. Each NPP has interim storage capacity for its own operational waste and some of its spent fuel. The radioactive waste from medicine, industry and research is stored at a federal interim storage facility. A centralised interim storage facility for all types of radioactive waste, particularly for vitrified high-level reprocessing waste and spent fuel, is in operation (see below).

Switzerland has ratified the IAEA's Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

## **PROGRAMMES and projects**

### ***WASTE conditioning***

Swiss legislation stipulates that the use of radioactive matter must result in as little waste material as possible. All waste material that is produced despite this minimisation requirement first has to be conditioned (i.e. brought into a stable state) and packed in suitable containers. The conditioning of radioactive waste is supervised by the Swiss Federal Nuclear Safety Inspectorate (ENSI).

L/ILW is reduced in volume by compaction, incineration or melting, treated with a leach-resistant bonding agent, usually cement but also bitumen or polystyrene in some cases, and solidified in containers, generally 200-litre drums but also larger containers. Long-lived ILW is conditioned in a similar way. Both vitrified HLW in its thin steel fabrication containers and spent fuel will be encapsulated in massive canisters for disposal.

### ***INTERIM storage***

As noted above, each NPP stores its own operational waste on site. Wastes arising from medicine, industry and research are under responsibility of the Federal State and stored since 1992 in the federal storage facility (Bundeszwischenlager BZL) operated by the Paul Scherrer Institute (PSI). The facility has capacity for 4,200 m<sup>3</sup> of waste (including future storage capacity).

A centralised interim storage facility (Zentrales Zwischenlager, ZZL, operated by ZWILAG), owned by the NPPs, is fully operational since 2002. It is located in Würenlingen, adjacent to the PSI site, and features a hall for dry storage of 200 casks containing spent fuel and vitrified HLW, as well as a storage building for ILW with a capacity of 11,000 m<sup>3</sup>. A hall for L/ILW waste, with a capacity of 27,000 m<sup>3</sup>, will be available for the storage of decommissioning waste from the NPPs. ZWILAG also has facilities for sorting and decontamination of materials and for the conditioning of waste, as well as a plasma furnace for incineration and melting of L/ILW. ZWIBEZ, an interim storage facility located at the Beznau NPP, can accommodate 46 storage casks for HLW and spent fuel. An additional interim wet storage facility was commissioned in 2008 at the Gösgen NPP, extending the on-site storage capacity from 600 to 1600 spent fuel elements. Sufficient interim storage capacity is thus available for all the waste arising from the present NPPs during their operating lifetime.

## ***DISPOSAL***

Deep geological disposal is prescribed for all types of waste in the nuclear energy legislation. Long-term safety of the repository must be assured without the need for active post-closure monitoring or control.

Additionally, the legislation requires a demonstration of the feasibility of safe and permanent disposal of radioactive waste in Switzerland. For low- and intermediate-level waste, such a demonstration was formally accepted by the federal government in 1988. Acceptance was based on a study of the technical feasibility and safety of the disposal concept, entitled “Project Gewähr 1985”, which was prepared by Nagra and reviewed by the regulatory authorities. Nagra’s site selection procedure for a L/ILW repository began in the 1970s. In 1993, Nagra proposed Wellenberg in Canton Nidwalden as the repository site and, in 1994, an application for a general licence was submitted. The review of licence application by the federal nuclear safety authorities came to a positive conclusion, but the granting of the mining concession required by cantonal legislation was rejected by the voters of Canton Nidwalden in a cantonal referendum (the siting commune of Wolfenschiessen voted in favour of the concession). A stepwise approach was subsequently proposed and an application for an exploratory shaft only (for a modified repository project) was submitted in 2001. Once again, the population of Canton Nidwalden rejected the concession application in September 2002, with the commune of Wolfenschiessen again voting in favour of the project. Consequently, the project was abandoned. A new site selection process, common to both L/ILW and HLW, started in 2008 (see below).

For the disposal of spent fuel, HLW and long-lived ILW, the demonstration of disposal feasibility (in German: “Entsorgungsnachweis”) was approved by the federal government in June 2006. This demonstration is based on a deep geological repository concept with in-tunnel emplacement of SF/HLW and caverns for long-lived ILW for a project with Opalinus Clay as the host rock. After an initial broad survey of options in the late 1970s, early siting studies focused on the crystalline basement of Northern Switzerland, but data on the overlying formations was also collected. The results of the investigations were integrated into the assessment carried out within the framework of “Project Gewähr 1985”. While the Federal Council accepted the demonstration of the safety and engineering feasibility of constructing a repository for HLW and long-lived ILW in the crystalline basement of Northern Switzerland, it had some reservations with respect to siting and was not convinced that sufficiently extensive rock formations with the required properties could be found. It therefore requested that the investigations be extended to include sedimentary formations. For the crystalline basement, the regional investigations were finalised and a comprehensive evaluation submitted to the authorities in 1994. Further studies identified the region of the Mettau valley in the canton of Aargau as a potential location for any further investigation of the crystalline basement.

In a stepwise process initiated in the mid-1980s with the safety authorities and their experts, several options in sedimentary rock were considered. To demonstrate the feasibility of disposal, the Opalinus Clay as a host rock and the Zürcher Weinland in the northern part of the Swiss Plateau as a model siting region was finally selected and a detailed characterisation programme was carried out. This included a 3D seismic campaign, the drilling of an exploratory borehole, experiments in the Opalinus Clay as part of the international research programme in the Mont Terri Rock Laboratory and the evaluation of information on Opalinus Clay from several other sources. Based on the results of these investigations, the demonstration of disposal feasibility (“Entsorgungsnachweis”) was submitted by Nagra to the Federal Council in December 2002 and approved by the Federal Council in June 2006.

The legislation that came into force in 2005 stipulates that the site selection process for both L/ILW and HLW repositories be defined in a so-called “sectoral plan” procedure within the framework of the existing

spatial planning legislation. Site selection should be based primarily on technical criteria, with the main emphasis on safety, but must also address land use planning and socio-economic aspects. The conceptual part of the Sectoral Plan for Deep Geological Repositories, defining a three-stage site selection process and a series of site selection criteria as well as the respective roles and responsibilities of the parties involved, was prepared by the federal authorities under the lead of the Swiss Federal Office of Energy (SFOE). Following a broad consultation process, it was approved by the Federal Council on 2 April 2008. With this decision, the Federal Council launched Stage 1 of the site selection process for deep geological repositories.

Stage 1 focuses on the identification of suitable siting areas based on safety and geological criteria. In October 2008, Nagra (on behalf of the waste producers) submitted a list of potential geological siting areas to the authorities. Siting areas for the L/ILW repository include:

- Südranden (Canton of Schaffhausen) with the host rock Opalinus Clay and its confining units
- Zürich Nordost (Cantons of Zurich and Thurgau) with the host rocks Opalinus Clay and the claystone sequence 'Brauner Dogger' with their confining units
- North of Lägern (Cantons of Zurich and Aargau) with the host rocks Opalinus Clay and the claystone sequence 'Brauner Dogger' with their confining units
- Jura Ost (Canton of Aargau) with the host rock Opalinus Clay and its confining units
- Jura-Südfuss (Cantons of Solothurn and Aargau) with the host rocks Opalinus Clay and its confining units and the Effingen Beds
- Wellenberg (Cantons of Nidwalden and Obwalden) with the host rock marl formations of the Helveticum

Siting areas for the HLW repository are:

- Zürich Nordost (Cantons of Zurich and Thurgau) with the host rock Opalinus Clay and its confining units
- North of Lägern (Cantons of Zurich and Aargau) with the host rock Opalinus Clay and its confining units
- Jura Ost (Canton of Aargau) with the host rock Opalinus Clay and its confining units

In the last three siting areas a so-called "combined repository" (L/ILW and HLW) is also considered.

After Nagra submitted its proposals for geological siting areas, a "Commission of Cantons" including representatives of the siting cantons, neighbouring cantons and neighboring states was established by the federal government. The Swiss Federal Nuclear Safety Inspectorate and their experts as well as the Federal Nuclear Safety Commission reviewed safety-related aspects of the proposed sites. In 2010, they both confirmed that Nagra's analysis of the geological information was technically justified, comprehensive and transparent and therefore approved the six proposed siting areas. The proposals by Nagra were also reviewed by an expert group of the cantons (AG SiKa/KES) and by a German expert group (ESchT); in their review reports both also approve Nagra's proposed siting areas. A broad public consultation process took place between 1 September and 30 November 2010 and gave rise to some 3,700 opinions, which have been compiled by the SFOE. To complete Stage 1, the proposals must be approved by the Federal Council and formally registered in the sectoral plan. The decision of the Federal Council is expected by the end of 2011. As a preparatory step for Stage 2 of the sectoral plan process, so-called "regional conferences" are being established in five out of six siting regions, including representatives of the local authorities, of the local population and of various interest groups. Stage 2 of the sectoral plan process includes a number of activities that will be undertaken in close collaboration with the siting regions, in particular a spatial planning assessment of siting possibilities for the surface infrastructure in the siting regions as proposed in Stage 1. As a



starting point for this assessment Nagra has to prepare proposals for siting of the surface infrastructure on behalf of the waste producers. Furthermore, socio-economic and environmental studies will be prepared. Nagra also has to carry out provisional quantitative safety analyses and a safety-based comparison of the siting areas that will allow the identification of at least two sites each for the HLW and L/ILW repository.

In Stage 3 of the process, the remaining sites will be investigated in depth with a view to site selection and preparation of an application for a general licence. The repository projects will be finalised together with the siting regions, while socio-economic implications will be analysed in greater depth. The siting regions will propose projects for the regional development and compile the background information necessary to determine compensation measures and to monitor socio-economic and environmental impacts. Compensation measures will be negotiated and published. Stage 3 will lead to the submission of applications for a general licence (one each for HLW and L/ILW or one for a so-called “combined repository”).

Parliament’s decision on the government’s approval of the general licence for deep geological repositories is expected around 2019/2020. That decision will be subject to an optional national referendum.

A deep geological repository for low and intermediate level radioactive waste is expected to be ready for operation in 2035 at the earliest, and a repository for high-level waste in 2045.

## **RESEARCH and development**

The federal government has the duty to guarantee independent research concerning radioactive waste disposal. For this purpose it created a research program covering its needs in this field until 2013. In this programme, the SFOE manages human and social science projects and ENSI the regulatory security research.

Extensive R&D programmes are run by Nagra to provide the geological, engineering and safety-related information required for developing the L/ILW and SF/HLW/ILW repository projects. Nagra is responsible for planning and funding R&D projects that are carried out to a large extent by external contractors. In addition to site-specific investigations and work in generic underground research laboratories (URLs), extensive programmes are run at PSI (co-funded by the Swiss government), universities and various research companies and institutes in Switzerland and abroad.

Nagra has close contacts with sister organisations in other countries and much R&D work is undertaken through collaborative, co-funded projects, in part within the framework of European Commission research programmes. International collaboration is particularly important in the studies carried out in underground rock laboratories, both at the Grimsel Test Site, located in crystalline rock in the Swiss Alps and at the Mont Terri Rock Laboratory, located in the Opalinus Clay of the Jura Mountains. The Mont Terri Project is an international project headed by the Federal Office of Topography (swisstopo), with partners from several countries. A number of experiments are co-financed by the European Union. The present programme consists of investigations aimed at obtaining information on the hydrogeological, geochemical and geomechanical characteristics of the Opalinus Clay. It also includes experiments for investigating the interaction between the engineered barriers and the host rock.

## **DECOMMISSIONING AND DISMANTLING POLICIES AND PROJECTS**

### **CURRENT status**

To date, the research reactors DIORIT and SAPHIR at the Paul Scherrer Institute (PSI), the research reactor at the University of Geneva and the experimental reactor at Lucens have been decommissioned or are in the process of being decommissioned. In July 2011, the PSI submitted to the SFOE the project for the decommissioning of its pilot incinerator plant which ceased operations at the end of 2002.

No commercial power reactors have been shut down or decommissioned.

### **RADIOACTIVE waste management for D&D**

If, when decommissioning waste arises, the L/ILW repository is not yet in operation, the waste can be stored at the centralised interim storage facility, where sufficient space is available for the decommissioning waste from the older NPPs. However, it is expected that the majority of decommissioning waste will be directly disposed of in an underground repository.

### **FUNDING for D&D**

The fund for financing the decommissioning and dismantling of nuclear installations (see under “Financing” below) no longer in service was set up more than 20 years ago to cover costs arising from the decommissioning and dismantling of nuclear installations no longer in use and from the management of the waste produced. Such a fund, into which the owners have to make advance payments, is required by the Nuclear Energy Act. The fund is administered by the federal government.

## **TRANSPORT**

All shipments of radioactive waste have to comply with Swiss nuclear energy and radiation protection legislation as well as with national and international transport regulations and recommendations. Switzerland has integrated the International Atomic Energy Agency's transport recommendations into its national regulations. ENSI is responsible for safety and control aspects of the shipment of radioactive materials.

The five Swiss NPPs, the PSI research institute and various hospitals, industrial facilities and research institutes are producers and users of radioactive materials. Shipments are carried out by several companies which specialise in the transport of radioactive materials.

## **RELEVANT AUTHORITIES & RESPONSIBILITIES**

The federal government is responsible for providing the legal framework, and its supervisory authorities are responsible for the supervision of NPPs and of the management of radioactive waste. The producers of radioactive waste are required to provide a safe means of its disposal and to bear the associated costs. For this purpose they established the National Co-operative for the Disposal of Radioactive Waste (Nagra).



The federal government is currently advised on radioactive waste management issues by:

- the Federal Nuclear Safety Inspectorate (ENSI)
- the Federal Commission on Nuclear Safety (KNS),
- the Commission for Nuclear Waste Disposal (KNE), which is mainly concerned with geological issues, and
- the Federal Interagency Working Group on Nuclear Waste Management (AGNEB).

The SFOE participates in the organisation and implementation of the various licensing procedures, and prepares decision-making bases for the relevant federal department and the Federal Council. It supervises operation of nuclear facilities and transportation. Licences and permits required for the construction of nuclear facilities and deep geological repositories, as well as for carrying out geological site investigations (e.g. deep boreholes), are issued by the federal government.

The Swiss Federal Nuclear Safety Inspectorate (ENSI) is the competent authority for supervising nuclear facilities with respect to radiation protection and nuclear safety at all stages of the life cycle. Since 2008, ENSI is also the competent authority with regard to physical protection. It has three main functions: ENSI (a) specifies the detailed safety requirements in regulatory guidelines, (b) reviews licence applications, and (c) supervises the nuclear facilities, the preparations for the disposal of radioactive waste, and the transport of radioactive material from and to nuclear facilities. ENSI has also certain licensing competences according to the radiation protection legislation.

The Federal Office of Public Health (FOPH), which is answerable to the Federal Department of Home Affairs (FDHA), is responsible for waste produced from medicine, industry and research. It also regulates the radiological protection (except in nuclear facilities). It is also responsible for monitoring radioactivity in the environment.

According to Swiss law, the producers of radioactive waste are responsible for its safe management. In 1972, the electricity supply utilities that operate the NPPs and the federal government, which is responsible for the radioactive waste arising from medicine, industry and research, therefore set up the *National Cooperative for the Disposal of Radioactive Waste (Nagra)*. Nagra is responsible for all preparatory work for the disposal of all categories of waste and for the eventual operation of corresponding facilities. The owners of the NPPs have also set up the company *Zwischenlager Würenlingen AG (ZWILAG)*, which is responsible for operating the ZWILAG centralised interim storage facility for vitrified waste, spent fuel and other wastes, as well as the on-site conditioning facilities, including the plasma incinerator. Responsibility for spent fuel reprocessing and transport, waste conditioning and on-site interim storage at the NPPs remains with the utilities.

## **FINANCING**

Under Swiss law, the producers of radioactive waste are required to cover the costs of managing their waste. Since the beginning of nuclear energy production, these costs have been provided for by setting aside financial reserves debited to the annual accounts during the operating lifetime of the power plants. These costs are an integral part of the operating and energy production costs. Current expenditure arising while the NPPs are still in operation, including the cost of conditioning operational waste at the power plants, reprocessing of spent fuel, operating centralised waste treatment facilities, research and development carried out by Nagra and

constructing interim storage facilities, are covered directly by the producers on an annual basis. The costs for decommissioning nuclear facilities and for waste management, including disposal, in the period after shutdown of the individual NPPs are covered by two separate funds, in accordance with the nuclear energy legislation. These funds are administered by a commission nominated by the *federal government*.

The *Decommissioning Fund* was set up in 1984 to cover the costs of decommissioning and dismantling, as well as the conditioning, transport and disposal of decommissioning waste. Annual contributions from the NPPs are calculated on the basis of an assumed NPP operating lifetime of 50 years. The ZWILAG interim storage facility also contributes to this fund. As of the end of 2010, the fund contained CHF 1,331 million (approx. EUR 967 million).

The *Waste Disposal Fund* for NPPs was set up in 2000. It must cover the costs of all activities associated with management of operational waste and spent fuel elements after the end of the operating lifetime of the power plants. These activities include packaging, transport, conditioning of spent fuel elements for direct disposal, interim storage and the construction, operation and closure of repositories. Annual contributions are based on estimates of waste management costs, which are subject to periodic review. At the end of 2010, the fund contained CHF 2,821 million (approx. EUR 2,412 million).

## **PUBLIC INFORMATION**

Governmental communication focusing on radioactive waste disposal is committed to ensuring a high level of transparency and public participation. The SFOE issues media releases, organises media conferences as well as public events, posts information on its website ([www.radioactivewaste.ch](http://www.radioactivewaste.ch)) and publishes brochures for the general public on specific issues. It releases every year a report encompassing a review of the past year. ENSI publishes brochures on special topics and provides independent public information on safety issues.

Nagra publishes technical reports (Nagra Technical Report (NTB) series), as well as brochures on specific topics of interest; a periodical information brochure is also available. Comprehensive information is also available on the Nagra website ([www.nagra.ch](http://www.nagra.ch)). For Nagra, it is of great importance to engage in dialogue with all involved organisations and with regional population groups. The overall aim is to be available at all times as a reliable source of information and as a dialogue partner. Apart from events organised by Nagra itself, Nagra staff also attend events organised by opponent groups as observers and make themselves available, if required, for open discussion. Since 2010, Nagra is also present in the new social media. For more information, the websites of relevant organisations are listed below.

## WEBSITES

### GOVERNMENT

#### **Swiss Federal Office of Energy (SFOE)**

Bern

Website: <http://www.radioactivewaste.ch>

E-mail: [sachplan@bfe.admin.ch](mailto:sachplan@bfe.admin.ch)

#### **Swiss Federal Nuclear Safety Inspectorate (ENSI)**

Brugg

Website: <http://www.ensi.ch>

E-mail: [info@ensi.ch](mailto:info@ensi.ch)

### RESEARCH

#### **Paul Scherrer Institute (PSI)**

Villigen

Website: <http://www.psi.ch>

E-mail: [pubrel@psi.ch](mailto:pubrel@psi.ch)

#### **National Cooperative for the Disposal of Radioactive Waste (Nagra)**

Wettingen

Website: <http://www.nagra.ch>

E-mail: [info@nagra.ch](mailto:info@nagra.ch)

#### **Grimsel Test Site**

Website: <http://www.grimsel.com>

#### **Mont Terri Rock Laboratory**

Website: <http://www.mont-terri.ch>

### INDUSTRY

#### **National Cooperative for the Disposal of Radioactive Waste (Nagra)**

(see above)

#### **ZWILAG Zwischenlager Würenlingen AG**

Würenlingen

Website: <http://www.zwilag.ch>

E-mail: [info@zwilag.ch](mailto:info@zwilag.ch)