

# Assessment and monitoring of discharges and their impact

November 2018

## **Prospective Assessment and Monitoring of Discharges**

Before discharges can be made under an environmental permit, we carry out an independent assessment of the potential environmental impact that could arise if discharges were made at the maximum level set in the permit over the course of a year. In practice, our approach is very pessimistic, as discharges are unlikely to be as high as this and more likely to be made at a small fraction of the level of limits in the environmental permit (currently discharges are generally less than 1 % of the corresponding permit limit, see tables 1 and 2). We only grant a permit if we are satisfied that discharges will not cause an unacceptable impact to the environment or the public.

In order to comply with the conditions of the Bradwell Site environmental permit, Magnox carry out monitoring of the levels of radioactivity in liquid wastes both before they make a discharge and when they make the discharge. Bradwell could potentially make two discharges per day, (as they have to discharge around high tides), although they are currently limited to a maximum of one discharge per day. Magnox uses this monitoring data as part of their arrangements to check the environmental performance of their abatement system and as a check against the regulatory requirements of their permit, including relevant limits on the amount of radioactivity that can be discharged in a year (or quarterly notification levels).

Magnox record and retain this information and compile these on a quarterly basis, which they then have to report to us. We then make these available by putting them on our public register. We closely monitor the discharge reports to check compliance with our requirements.

We make Magnox keep samples of the liquid discharges made from Bradwell and these are independently analysed by our own contractor at an independent laboratory. We use the results we get from our independent contractor to compare with the Magnox results.

In addition every year Bradwell must produce a more detailed analysis of the liquid discharges which includes analysis for more than 30 different radionuclides. Of these, 20 are typically so low that they are below the limit of detection for the analytical methods used. We also make this information publically available. We also send this discharge information to the European Union in accordance with the UK's obligations under the Euratom treaty.

Every year we publish the Radioactivity in Food and the Environment report (RIFE), which includes a summary of discharges made from Bradwell under its permit during the previous year. RIFE reports, including those covering previous years are available on [www.gov.uk](http://www.gov.uk). The most recent RIFE report, (RIFE 23) was published and is available along with previous reports on the GOV.UK website here:

<https://www.gov.uk/government/publications/radioactivity-in-food-and-the-environment-rife-reports>.

### **Environmental monitoring**

We also make Magnox carry out monitoring of the environment around the Bradwell site to identify the levels of radioactivity in the environment. This includes sediments in the Blackwater Estuary, sea food and other foods including those produced on local farms. Some of these samples are taken on a monthly basis and others are taken on a quarterly, or seasonal basis, for example to reflect when particular foods might be available.

We make Magnox review this monitoring and report any abnormal readings to us, directly. The results from the environmental monitoring programme must also be kept and sent to us every calendar quarter. We monitor these reports and then make these available on the public register.

In addition to the monitoring Magnox do, we carry out our own independent environmental monitoring programme. This means we have an independent comparison with the data from Magnox's programme. The Food Standards Agency also carries out independent sampling of food around Bradwell. Both programmes of monitoring are very long standing (more than 20 years) and show that the levels have been and continue to be very low. Levels of many radionuclides are now close to or below the limit of detection.

### **Compliance monitoring**

Overall, the arrangements for monitoring, surveillance and compliance inspection in place at nuclear licensed sites are sufficiently comprehensive and rigorous to provide confidence and reassurance that discharges are made in accordance with regulatory requirements and, in the case of the Bradwell site, provide confirmation that the environmental impact arising from permitted discharges remains very low.

### **Habit Surveys and Retrospective Assessment**

We use information about local habits to help us make the assessment of the worst case potential environmental (radiological) impact, published in RIFE. This information about habits is taken from a survey of habits in the local area that we carry out and review periodically. In August 2015, CEFAS (Centre for Environment, Fisheries and Aquaculture Science) on behalf of the EA and the FSA carried out a survey of habits in the local area. The Bradwell Site habit survey has now been published and is available on the Cefas website, here: <https://www.cefas.co.uk/publications/environment/bradwell2015.pdf>

Previous Bradwell Site habits surveys as well as surveys carried out around other sites can also be found on the CEFAS website, via the Cefas publications page, here:

<https://www.cefas.co.uk/cefas-data-hub/search-publications/>

There have been environmental permits covering the radioactive discharges from the Bradwell site for over 50 years and understanding of how the radioactivity from discharges behaves in the environment is very high.

During 2017, the identified impact to local individuals from levels of radioactivity in the environment was less than half a percent of the limit set for members of the public (i.e. <5 microsieverts / year compared with the limit 1000 microsieverts / year). The average radiation dose in the UK population is around 2700 microsieverts / year from all sources.

### Further Information

Details about the discharges and the levels of radioactivity in the environment and our assessment of the impact are published in the RIFE report and openly available via [www.gov.uk](http://www.gov.uk) by searching for 'monitoring radioactivity'.

