

The European Waste Catalogue

a platform for a common approach to NORM and other industrial waste

Bogusław Michalik¹, Stéphane Pépin², Nick Tsurikov³

¹ Central Mining Institute (GIG), Katowice, Poland

² Federal Agency For Nuclear Control, Brussels, Belgium

³ Calytrix Consulting Pty Ltd, Perth WA, Australia

(TE) NORM waste looks like

„common“ industrial one:

occurs in bulk quantities deposited directly in the environment,

consists of wide variety of chemical compounds and different minerals,

after releasing can start chemical or physical processes leading to the additional concentration of contamination,

and

contains high enough activity concentration of radionuclides to be classified as radioactive waste.



in comparison.....

Radioactive waste characterisation

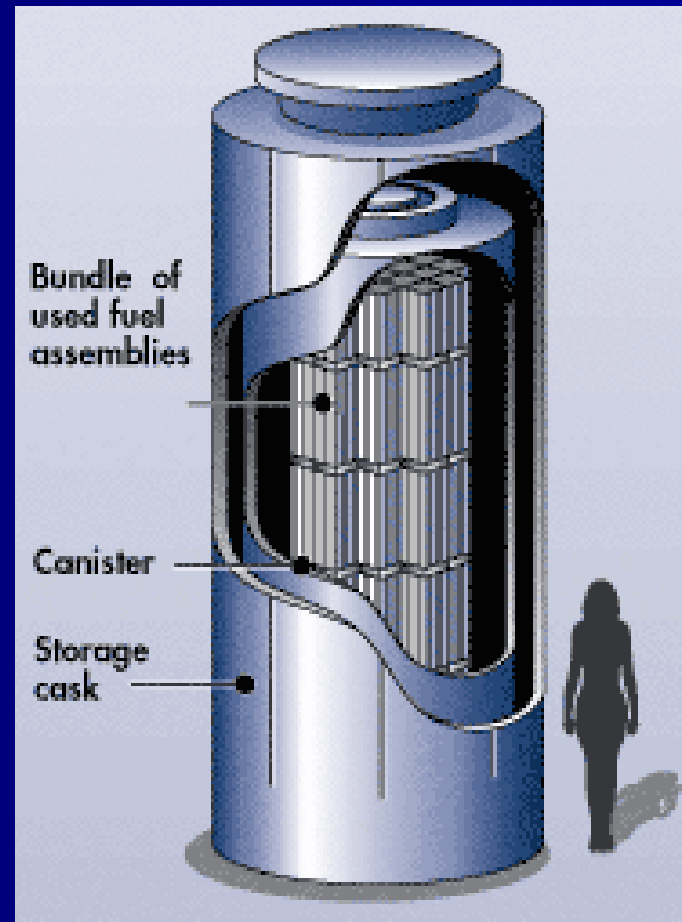
Total amount of spent nuclear fuel
in USA: **58 000** tonnes.

Currently, most spent nuclear fuel is
safely stored in specially designed
pools at individual reactor sites

Radioactive waste

...or they are kept in

**Dry Cask
Storage
System**



U.S. NRC – United States Nuclear Regulatory Commission

Council Directive 96/29/Euratom of 13 May 1996

laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation

■ **TITLE VII. SIGNIFICANT INCREASE IN EXPOSURE DUE TO NATURAL RADIATION SOURCES**

Article 40

1. This Title shall apply to work activities not covered by Article 2 (1) within which the presence of natural radiation sources leads to a significant increase in the exposure of workers or of members of the public which cannot be disregarded from the radiation protection point of view.

2. Each Member State shall ensure the identification, by means of surveys or by any other appropriate means, of work activities which may be of concern. These include, in particular:

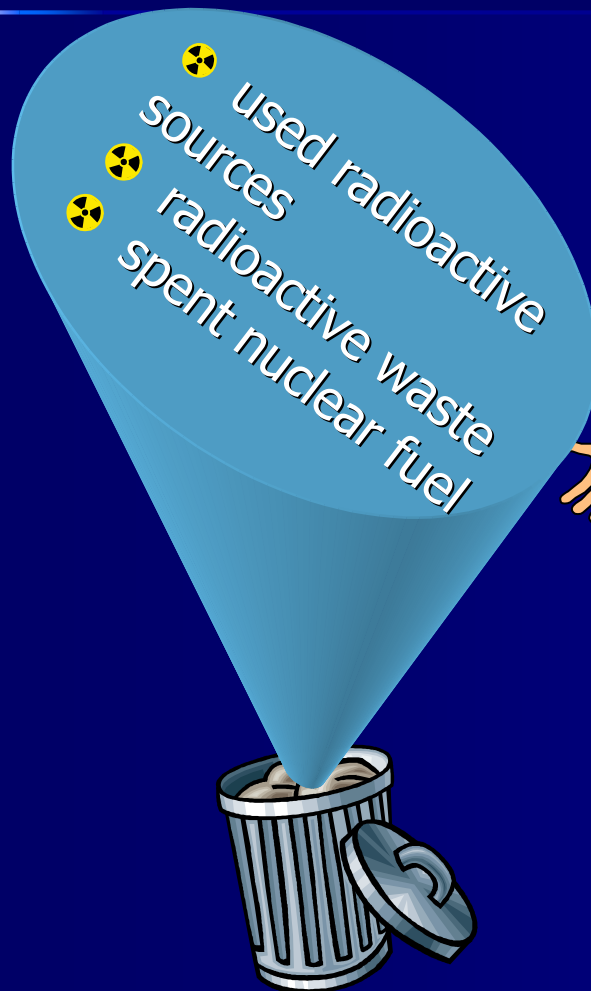
(a) work activities where workers and, where appropriate, members of the public and exposed to thoron or radon daughters or gamma radiation or any other exposure in workplaces such as **spas, caves, mines, underground workplaces** and above ground workplaces in identified areas;

(b) work activities involving operations with, and storage of, materials, not usually regarded as radioactive but which contain naturally occurring radionuclides, causing a significant increase in the exposure of workers and, where appropriate, members of the public;

(c) work activities which lead to the production of residues not usually regarded as radioactive but which contain naturally occurring radionuclides, causing a significant increase in the exposure of members of the public and, where appropriate, workers;

(d) aircraft operation.

Difficulties in law enforcement....



TENORM/NORM waste

ASPECTS OF RADIATION PROTECTION REGULATED BY LAW

- radiation dose limits
- rules of classification as radioactive waste and spent nuclear fuel (exclusion, exemption and clearance levels)
- the instances where practices involving the risk of exposure to radiation must be licensed

Existing regulations overlap

ICRP recommendation Basic Safety Standards

- ☢ radioactive sources & irradiating apparatus,
- ☢ radioactive waste,
- ☢ nuclear fuel cycle activities:

uranium mining
and milling

NORM/TENORM
activities

Protection of
environment

&

industrial waste
mangement



The vicious circle

No data....



No needs for
regulatory
control...



NORM/TENORM industry isn't
focused on deliberate use of
radiation risk
monitoring...
SO.....

an example.....



*Jury: Energy giant must pay \$2 million
By The Associated Press
Friday, March 05, 2010*

A state district court jury decided Friday that Exxon Mobil Corp. failed to warn workers that offshore drilling pipes they cleaned over decades contained radioactive contamination.

Sixteen former employees of now-defunct Intracoastal Tubular Services, of Harvey, **were awarded nearly \$2 million as compensation for the increased risk of developing cancer.** The jury declined to award punitive damages.

"We still believe that our pipe did not cause any harm," Exxon Mobil attorney Charles Gay said after the verdict.

Plaintiff attorney Tim Falcon said the former workers were disappointed by the award, but still called the finding that Exxon was at fault "a victory."

The verdict came after seven days of deliberations. No blame was placed on Intracoastal Tubular Services.

The suit was filed in 2001 after a New Orleans **jury awarded the Grefer family, which owns the property on which the pipes were cleaned, \$1 billion in punitive damages against Exxon Mobil and ITCO.** The family leased 33 acres for three decades to ITCO.

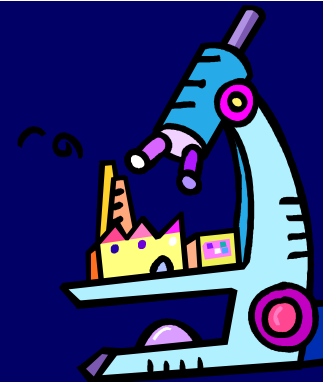
The European Waste Catalogue

is a fundamental part of a duly waste disposal

- It classifies both hazardous and non-hazardous waste produced pursuant to European Council *Directive 75/442/EEC of 15 July 1975 on waste*,
 - categorizes them according to what they are and how they were produced,
 - defines standardized nomenclatures
- and.....
- The EWC codes are valid throughout Europe and contain just about any waste conceivable

(but hitherto TENORM and NORM type waste are not identified..)

Rules of classification



- adherence to the particular group of NORM industry according to IAEA and EC positive list, respectively; (IAEA 1-11, EC 1-14)
- occurrence in technological processes with significant initial mass reduction (mainly thermal processes) (T1)
- adherence to the kind of waste created during water (potable, technological, underground) treatment (W1)
- adherence to the kind of waste created during atmospheric air, exhausted gases or natural gas cleaning (treatment) (A1)
- data collected by authors of this article (GIG 1-5)

Central Mining Institute (GIG), Katowice, Poland

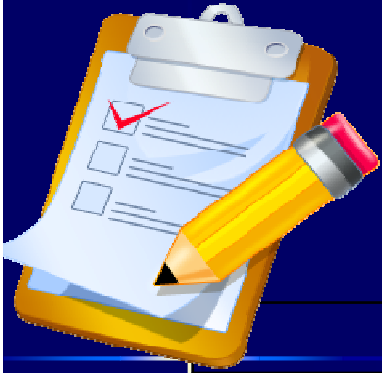
Federal Agency For Nuclear Control, Brussels, Belgium

Calytrix Consulting Pty Ltd, Perth WA, Australia



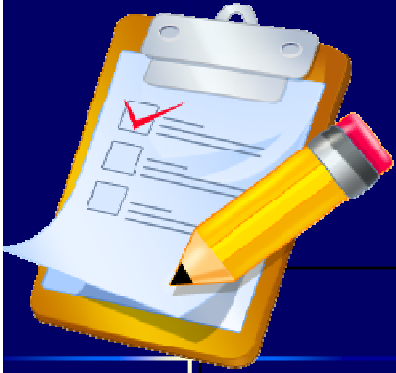
NORM industry according to the IAEA

NORM industry	NORM industry code
Rare earths extraction	IAEA 1
Thorium extraction & use	IAEA 2
Niobium extraction	IAEA 3
Non-uranium mines	IAEA 4
Oil and gas production	IAEA 5
TiO ₂ pigment production	IAEA 6
Phosphate industry	IAEA 7
Zircon & zirconia industries	IAEA 8
Metals production (Sn, Cu, Al, Fe, Zn, Pb)	IAEA 9
Burning of coal etc.	IAEA 10
Water treatment (²²² Rn, solid residues)	IAEA 11



NORM industry according to the EC

NORM industry	NORM industry code
Extraction of rare earths from monazite	EC 1
Production of thorium compounds and manufacture of thorium containing products	EC 2
Processing of niobium/ tantalum ore	EC 3
Oil and gas production	EC 4
TiO ₂ pigment production	EC 5
Thermal phosphorus production	EC 6
Zircon & zirconia industries	EC 7
Production of phosphate fertilizers	EC 8
Cement production, maintenance of clinker ovens	EC 9
Coal fired power plants, maintenance of boilers	EC 10
Phosphoric acid production	EC 11
Primary iron production	EC 12
Tin/lead/copper smelting	EC 13
Ground water treatment	EC 14

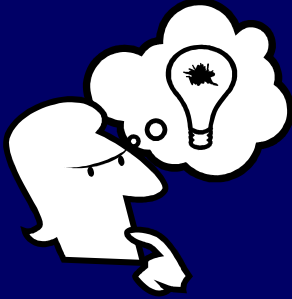


NORM industry according to GIG

NORM industry	NORM industry code
coal mining	GIG 1
production and use of abrasive materials	GIG 2
production and use of refractories	GIG 3
processing of potassium rich minerals	GIG 4
paper production	GIG 5

Among 674 individual waste already classified in EWC 257 are at least suspected as being TENORM or NORM.....

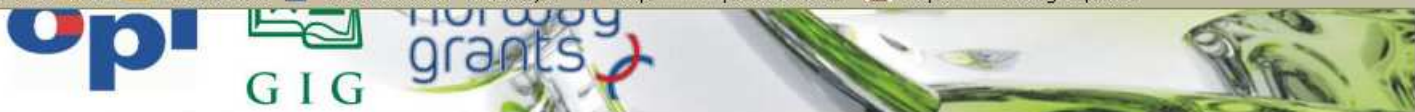
- **group 10:** waste from thermal processes
- **group 01:** waste resulting from exploration, mining, quarrying, physical and chemical treatment of minerals
- **group 06:** waste from petroleum refining, natural gas purification and pyrolytic treatment of coal



Conclusion

The EWC is a good tool to make the first awareness about significant radiation risk existing beyond the nuclear industry and use of radioactive sources.

Completion the EWC with qualitative information about possibility of radiation risk should be followed by data bases containing specific properties of each kind of NORM/TENORM waste, as it was done in case of hazardous and dangerous materials.



General informations

- ▶ General informations
- ▶ About PORANO
- ▶ Participants of the project

Waste catalog

- ▶ Waste

Search Engine

Form

- ▶ Complete the form

Multimedia

- ▶ Presentations
- ▶ Articles

Login

Form

Complete the form

waste code:

waste name/description:

NORM / TENORM: NORM TENORM

nuclide/isotope:

- | | | | |
|----------------------------------|-------------------|-----------------------------------|-------------------|
| <input type="checkbox"/> U-238 + | activity (Bq/kg): | <input type="checkbox"/> Pb-210 | activity (Bq/kg): |
| <input type="checkbox"/> U-238 | activity (Bq/kg): | <input type="checkbox"/> Po-210 | activity (Bq/kg): |
| <input type="checkbox"/> U-234 | activity (Bq/kg): | <input type="checkbox"/> Th-232 + | activity (Bq/kg): |
| <input type="checkbox"/> Th-230 | activity (Bq/kg): | <input type="checkbox"/> Th-232 | activity (Bq/kg): |
| <input type="checkbox"/> Ra-226 | activity (Bq/kg): | <input type="checkbox"/> Ra-228 | activity (Bq/kg): |
| <input type="checkbox"/> Rn-222 | activity (Bq/kg): | <input type="checkbox"/> Th-228 | activity (Bq/kg): |

contact person:

e-mail/phone:

source:



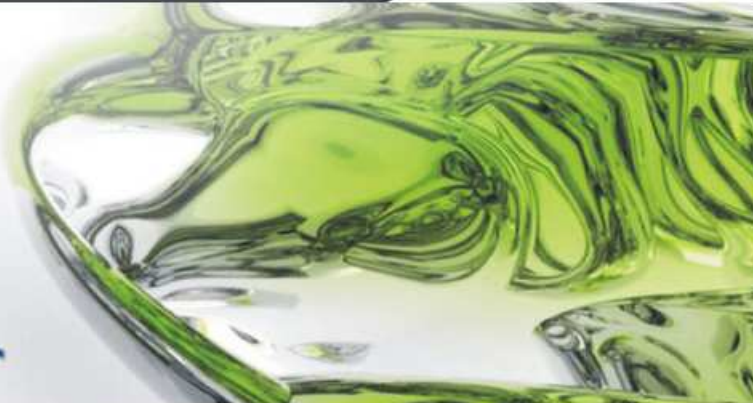
Please enter text from image

After you enter correct letters, you will be able to send this form.



porano

Survey of the impact of enhanced natural radioactivity on human and natural environments



General informations

- ▶ General informations
- ▶ About PORANO
- ▶ Participants of the project

Waste catalog

- ▶ Waste

Search Engine

Form

- ▶ Complete the form

Multimedia

- ▶ Presentations
- ▶ Articles

Login

Search Engine

Pick up code:

Waste name: sludges from washing and cleaning

Waste Code:

Waste Name/Description:

Radioactivity: none- | NORM- | TENORM-

Isotopes: [add isotope](#)

Page: Records per page:

Finded 0 records

No record for that query

www.porano.gig.eu



**Thank you for the
attention**

2007 3 23