



# Interspill. London. March 2011

# Predicting and Prioritising Public Health Risk: Development of a Semi-Quantitative Matrix

Prepared by Health Protection Agency and Public Health Wales
On Behalf of Pembrokeshire County Council











### **ARCOPOL**

Atlantic Area Transnational Cooperation Programme following up from EROCIPS project

- —Funded by ERDF
- -Strengthen cohesion in the EU
- Exchange of experience knowledge and good practices

### **Key Objectives**

- -Improve response capabilities in the event of HNS and inert spills
- Raise awareness and improve training of responders
- -Promote cross border collaboration between neighbouring countries
- -Improve mitigation capabilities











# HNS Hazardous and Noxious Substances

"Any substance **other than oil**, which, if introduced into the marine environment is likely to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea"

- OPRC-HNS Protocol 2000















### Public Health Risks from HNS

Large numbers and quantities of HNS transported by sea.

Many hazardous to health and reactive with environment and each other.

Accidents and spills occur.

Many industrial ports close to Population centres

Release close to shore could have serious public health impact.













### **Need for Risk Prioritisation**

Increasing numbers of HNS carried, larger cargoes, panacea of potentially catastrophic effects.

Regulation and global initiatives e.g OPRC HNS Protocol emphasising the need for planning and preparedness to control risks.

Limited resources and changing threats

Enable structured / evidence based approach to plan, prepare and target resources for potential events















### Risk Prioritisation Overview

Risk prioritisation undertaken using conventional methodology;

### Risk = Severity x Likelihood

Prioritisation focuses on acute risks to human health and potential for exposure via inhalation and direct contact.











# Severity

Estimated as acute human health effects by determination of chemical toxicity together with chemical reactivity and the potential to reach a target receptor



Based upon GESAMP List and SEBC behaviour classifications

### Likelihood

Probability of a **spill** within European Atlantic waters estimated from **quantities of HNS transported by sea**.

Based on annual import and export data as a proxy using UK / EU trade statistics and results of other studies (HASREP)











# **HNS Priority List**

CHEMICAL NAME	Toxicity	Behaviour score	Tonnage Score	Risk
CHLORINE	7	10	4	
ETHYLENE OXIDE	7	10	4	
METHYL AMINE SOLN	7	9	3	
AMMONIA	5	9	4	
2-(2-AMINOETHOXY) ETHANOL	7	8	3	
VINYL CHLORIDE	4	10	4	
2-AMINO-2-METHYL-1-PROPANOL	7	7	3	
3-METHYL PYRIDINE	6	7	3	
FORMALDEHYDE	7	9	2	
DIMETHYLAMINE	6	9	2	
HYDROFLUORIC ACID	6	9	2	
METHYLAMINE ACID	4	9	3	
TRIMETHYLAMINE	6	9	2	
ZINC BROMIDE	7	5	3	
ZINC CHLORIDE	7	5	3	
ALUMINIUM CHLORIDE	7	5	3	
ANLINE	5	5	4	
METHANOL	4	5	5	













# Limitations of the Process

Chemical toxicity and behaviour data are well defined GESAMP, OSPAR and others.

Limitations were identified in estimating likelihood

- Ports / Regions have limited records
- Reluctance to provide detailed information on HNS.
- Likelihood is not just related to quantity shipped



### Developed usable software to enable site specific prioritisation







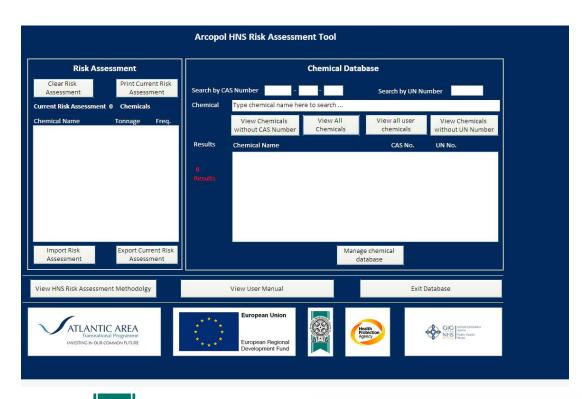




# **Prioritisation Tool**

Run on MS Access 2007 or 2003

Uses same assessment process as developed for original prioritisation





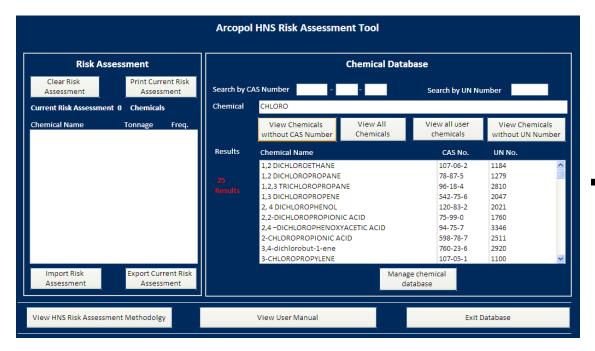


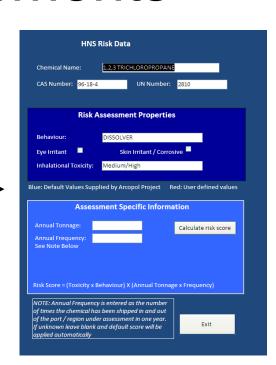






### Risk Based Assessments





Database of 350 chemicals

Calculates priority HNS based upon user defined shipping data entered





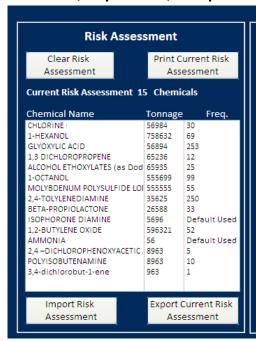






# Prioritisation Report

Produces site and time specific prioritisation reports. Can review, share, update, import as required









**European Union** 

lechyd Cyhoeddus

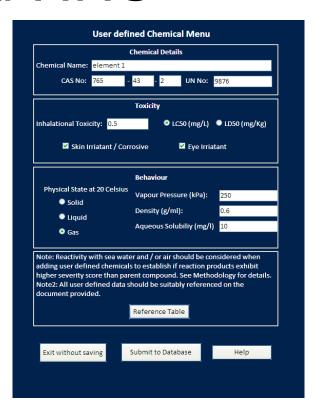






## **User Defined HNS**

Can add other chemicals using readily Available toxicity and behaviour data















### Conclusions

Tool developed for Prioritisation of HNS based on human health

Will be available for use at all levels from local port operators to International emergency planners

Can help target resources and response on geographical basis – monitoring, sampling, PPE, spill control

Can be updated as science develops or trade patterns change

Could be applied to other risks such as eco, chronic etc

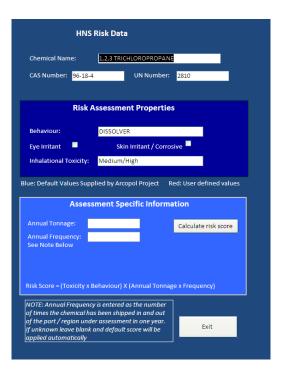
Could potentially be applied to other scenarios e.g. industrialised areas















# Thank You









