EUROPEAN COMMISSION

Community Research

PROTECT

Protection of the Environment from Ionising Radiation in a Regulatory Context

(Contract Number: 036425 (FI6R))

PERIODIC ACTIVITY (MID-TERM) REPORT

Author(s): **Howard, B.J., Beresford, N.A., Copplestone, D., Andersson, P., Garnier-Laplace, J., Brown, J.E.**

Lead contractor for this deliverable: **NERC-CEH**

Date of issue of this report: 27/11/07
Revision [v1.1]

Start date of project : 1/10/06 Duration : 24 Months

Project co-funded by the European Commission under the Euratom Research and Training Programme on Nuclear Energy within the Sixth Framework Programme (2002-2006)		
Dissemination Level		
PU	Public	X
RE	Restricted to a group specified by the partners of the [PROTECT]	
CO	Confidential, only for partners of the [PROTECT] project	

Name	Number of copies	Comments
EC, Henning von Maravic	1	pdf
	2	hard copy
PROTECT Partners	1	pdf
Workpackage 1 workshop participants	1	pdf
PROTECT website	1	pdf on Outputs page

The EU EURATOM funded PROTECT project (FI6R-036425) will evaluate the different approaches to protection of the environment from ionising radiation and will compare these with the approaches used for non-radioactive contaminants. This will provide a scientific justification on which to propose numerical targets or standards for protection of the environment from ionising radiation.

Project Co-ordinator: Natural Environment Research Council, Centre for Ecology & Hydrology

Contractors:

Natural Environment Research Council, Centre for Ecology & Hydrology	(NERC-CEH)
Swedish Radiation Protection Authority	(SSI)
Environment Agency	(EA)
Norwegian Radiation Protection Agency	(NRPA)
Institute for Radiological Protection and Nuclear Safety	(IRSN)

Dissemination level: PU
Date of issue of this report: 27/11/07

Table of Contents

Publishable Executive Summary

The PROTECT coordinated action aims to evaluate the practicability and relative merits of different approaches to protection of the environment from ionising radiation. The project is also comparing these approaches with methods used for non-radioactive contaminants, particularly with respect to European frameworks for chemicals.

Activities in the first year have focussed on a review of approaches to protection of the environment from ionising radiation and chemicals. Environmental regulators, nuclear and non-nuclear industries, and NGO's were asked, via a questionnaire, to identify the key regulatory instruments for assessment and give their views on how environmental regulation is applied. Similarities and differences in approaches to the regulation of radioactive substances and chemicals were also discussed. Initial findings from the questionnaire were discussed at a workshop involving experts external to the PROTECT consortium representing regulators, NGOs and industry. Although most regulators responding to the questionnaire stated that they regulated to protect the environment, many of these organisations cited previous International Commission of Radiological Protection (ICRP) statements (i.e. *The Commission believes that the standards of environmental control needed to protect man to the degree currently thought desirable will ensure that other species are not put at risk*). Of those responding only three EU member states specifically regulate radioactive substances to protect the environment *per se*. However, many respondents noted that they were anticipating changes driven by international guidance (i.e. by the ICRP, International Atomic Energy Agency (IAEA) or EC). A deliverable summarising the questionnaire response, workshop discussions and considerations from the PROTECT consortium will be made available for open consultation in mid November 2007.

Tools available to demonstrate that the environment is protected from ionizing radiation have been identified and an evaluation of these approaches has begun. A workshop was held involving experts external to the PROTECT consortium to discuss how approaches are being used in assessments, identify areas which work well or require improvement and assess their relevance to third parties. A scenario was used to compare readily available tiered assessment approaches during the workshop. There were considerable differences in the outputs when applied as screening level models. The reasons for, and implications of, the differences are being more fully investigated in follow-up work by the consortium.

There has been significant collaboration during the PROTECT coordinated action with all relevant international bodies and extensive consultation through the project's website, newsletters and workshops. It is anticipated that the output of ICRP Committee 5, due January 2008, will form an important input to further activities by the PROTECT consortium.

1. Project objectives and major achievements

1.1 Milestone achieved

The PROTECT project is running to schedule with all milestones for WPs 1, 2 and 4 due in the first 12 months met. The WP1 milestone *Complete review of regulatory approaches* was delayed to maximise the number of questionnaire responses. However, an initial evaluation, was presented at the WP1 workshop in Month 6. Workpackage 3 had a milestone *Decision on appropriate level of protection* planned for Month 11. This, and wider issues of interaction between WP1 and WP3, were discussed at an additional small consortium meeting (held August 2007). More logically this milestone should correspond with the production of the draft deliverable due January 2008 from the WP and the table below has been amended to reflect this more relevant, revised delivery date.

Table 1.1. PROTECT CA monitoring against project milestones and deliverables.

Month	Checkpoints	Delivery	Status
Month 1	WP4: Project presentation Deliverable 1	15th January 2007	Late
	WP4: distribute agenda for *first project meeting.*	24th October 2006	On schedule
	WP4: Convene *first project meeting*	26th-27th October 2006	On schedule
Month 2	WP4: deliver minutes of *first project meeting*	14th November 2006	On schedule
Month 3	WP4: Website established and populated Deliverable 6	November 2006	Earlier than intended
	WP4: Statement on signature of the Consortium Agreement	26th October 2006	Earlier than intended
Month 5	WP4: Circulate draft communication action plan	27th March 2007	Circulated late
	WP1: Distribute agenda for Workshop to *discuss regulatory approaches and requirements*	5th March 2007	Slightly late
Month 6	WP1: Workshop to *discuss and agree on the data on regulatory approaches*	29-30th March 2007	On schedule
	WP4: Final communication action plan Deliverable 2	3rd April 2007	On schedule
	WP4: Interim Management Report	5th April 2007	Sent early
Month 7	WP1: Complete review of regulatory approaches	1st August 2007	Extended deadline
	WP1: Deliver minutes on Workshop to *discuss regulatory approaches & requirements*	2nd May 2007	On schedule
Month 8	WP2: Distribute agenda for Workshop *to define different approaches available and agree evaluation exercises*	23rd May 2007	On schedule
Month 9	WP2: Workshop to *define different approaches available and agree evaluation*	End June 2007	On schedule

	exercises		
Month 10	WP1: Complete review of the endpoints of protection and similarities and differences between approaches for chemicals and radioactive substances WP2: deliver minutes on Workshop to *define different approaches available and agree evaluation exercises*	1st August 2007 1st August 2007	On schedule On schedule
Month 11	WP3: Decision on appropriate level of protection	On-going	Revised due date January 2008
Month 14[1]	WP4: Year 1 management and activity reports and financial cost statements	Mid-November 2007	On Schedule

[1]This milestone was incorrectly timetabled as Month 12 in the DoW (the revised date matches requirements of the EC).

1.2. Publications from the PROTECT CA

The following outputs have been produced, and are available on the PROTECT website (Deliverable 6) (http://www.ceh.ac.uk/protect/).

Table 1.2 Outputs on the PROTECT website.

Public Area	Consortium Protected Area
Technical Annex I: web version (no financial information)	Technical Annex I – complete version (28-05-04)
List of Consortium members	Consortium agreement
Information, guidance and claim forms for Expert group events/Workshops	Minutes from 1st project meeting (Lancaster) and associated presentations
Workshop agenda - Chester	Interim management report
Finalised minutes and presentations of Chester workshop	Power Point presentation template
Questionnaires available to download for Regulators/Advisory bodies and Industry	Consortium minutes Chester meeting March 2007
Links to various environmental protection documents (radioactive, chemical and EC)	Consortium minutes Warrington meeting August 2007
List of project deliverables	
Deliverable 1- Project Presentation	
Deliverables from previous EURATOM projects: ERICA, FASSET, EPIC available to download	
Deliverable 2 - Communication action plan	
Workshop agenda - Vienna	
Finalised minutes and presentations of Chester workshop (linked to presentations)	
WP2 feedback form on available models/tools	
Draft PROTECT Glossary	
Tutorial and accompanying documentation on application of species sensitivity distributions	
Triggers v's standards – discussion document	
PROTECT poster (presented at UK COGER meeting)	
PROTECT Newsletter #1 (May 2007)	
PROTECT Newsletter #2 (September 2007)	

1.3. PROTECT Deliverables

Deliverables as specified in the DoW for this reporting period have been produced (see Table 1.3). Deliverable 3 the next output due is now available (October 2007) for comment by the consortium.

Table 1.3. PROTECT deliverables.

Del. no.	Deliverable name	WP	Delivery date (project month)	Actual/ forecast delivery date	Estimated person-months	Used person-months	Lead Participant
D1	Project presentation	4	1	4	0.25	0.2	CEH
D2	Communication Action Plan	4	6	7	0.25	0.2	CEH
D3	A review of approaches to protection of the environment from chemicals and ionising radiation - requirements and recommendations for a common framework	1	14	14	10.5	9*	EA
D4	Evaluation of the practicability of different approaches for protecting the environment from ionising radiation in a regulatory context and their relative merits	2	22	22	10.3		CEH
D5	Aims, and associated secondary numerical targets, for protecting biota against radiation in the environment A: Recommendations for further actions B: Proposed levels and underlying reasoning C: Records of end users' views on feasibility of proposed targets	3	24	24	10		SSI
D6	Web site	4	3-24	2	1	1	CEH
D7	Final Plan for using and disseminating knowledge	4	24	24	0.5	0.25	CEH
D8	Report on raising public participation and awareness	4	24	24	0.5	0.25	CEH

*Not yet completed, continuing into year 2.

1.4. Publicising the PROTECT CA

The PROTECT CA has produced two newsletters distributed to interested parities in May and September 2007 by email (circulation list >160 email addresses); recipients include regulators, NGO's, industry (and industry groups) and the research community. Future newsletters will be produced to coincide with outputs/activities of PROTECT (e.g. workshop reports; WP deliverables).

Presentations on the PROTECT CA have been made at the following events:

IAEA EMRAS (November 2006): oral presentation (*PROTECT: Protection of the Environment from Ionising Radiation in a Regulatory Context*; Howard).

BIOPROTA workshop (January/February 2007): oral presentation (*EC Methodology development and potential application*; Howard). (Presentations updating PROTECT progress were requested and provided for a subsequent BIOPROTA workshop in May 2007).

United Kingdom COGER meeting (17-19th April 2007): poster presentation (*PROTECT: Protection of the Environment from Ionising Radiation in a Regulatory Context*; Howard, Beresford, Barnett, Copplestone, Hingston, Andersson, Brown & Garnier-Laplace).

Royal Society of Chemistry conference 'Future Energy: Chemical Solutions' (September 2007): poster presentation (*PROTECT: Protection of the environment from ionising radiation in a regulatory context;* Copplestone, Beresford, Brown, Garnier-Laplace, Andersson, Hingston, Howard, Barnett, & Whitehouse).

IUR Task Group on Waste workshop (October 2007) – attended by PROTECT co-ordinator.

Additional presentations have been made to experts attending the PROTECT workshops in Chester (WP1) and Vienna (WP2). One of the expert attendees at the Chester workshop presented a poster on PROTECT to the Italian Radiation Protection Society (S. Risica; Il Progetto PROTECT).

Three abstracts on each of PROTECT WP's 1-3 have been submitted as oral presentations to the International Conference on Radioecology and Environmental Radioactivity to be held in Bergen (June 2008).

Over the period since the website was launched there has been an average of 15 visits per day, with an increasing trend since April 2007, potentially coinciding with the first workshop and Newlsetter (Figure 1.1).

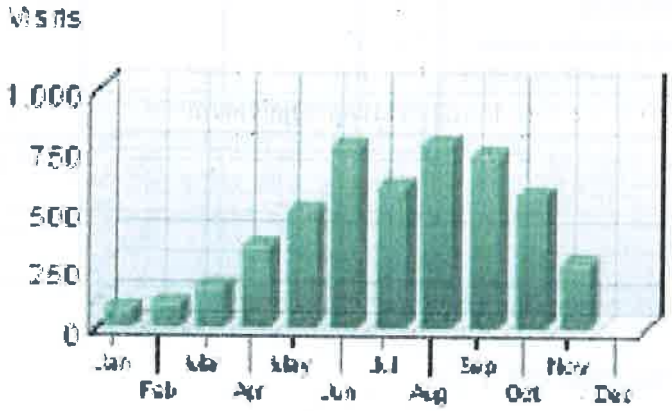

Figure 1.1. Trend in visits to the PROTECT CA website (www.ceh.ac.uk/PROTECT/).

2. Workpackage progress of the period

Progress in each of workpackages 1-3 during the first year of the PROTECT CA is described below. During this period the focus of the work has been WP1 and to a lesser extent WP2; WP3 activities were not planned to start until Month 10.

2.1 Workpackage 1 Environmental protection concepts

Task 1 Review of national and international regulatory methodologies and criteria currently applied environmental protection from radioactive substances

The first 12 months have been dedicated to assessing national and international regulatory instruments, procedures and underlying principles and the criteria currently applied in different countries to environmental protection from radioactive substances. Environmental regulators, nuclear and non-nuclear industries, and NGO's were asked to identify the key regulatory instruments for assessment and give their views on how environmental regulation is applied.

The gathering of this information was completed through questionnaire (both verbal and electronic) and a workshop (in Month 6). Out of approximately 130 organisations contacted, responses from 49 have been received through questionnaires. Regulators constituted 37% of this response, industry 35%, NGOs and international organisations, 10% and advisory bodies, 18%. Although the questionnaires were primarily targeted at environmental regulators and representatives from industry within EU member states it was recognised that worldwide perspective would also be invaluable and responses were also sought and obtained from, for example, Canada and Australia.

The workshop in Chester, UK (Workshop report: Regulatory Approaches & Requirements (29th-30th March 2007, Chester, UK)) was held for environmental regulators drawn from a number of member states of the EU to discuss and explore areas relating to the protection of the environment in more detail. A draft report on the regulatory approaches and requirements was provided to participants in advance to facilitate discussions. The workshop format involved presentations from a number of PROTECT participants and sixteen independent experts. The topics of the presentations were selected to aid discussion around issues highlighted in the questionnaires responses that had been received from regulators, advisory bodies, NGOs and industry by the beginning of March 2007 (see Table 2.1). As a result, the workshop was divided into three sessions. Each session started with one or more presentations and then the workshop participants split into three facilitated breakout groups to discuss two questions related to the session. This was followed by a plenary session to feedback details of the breakout groups.

Table 2.1 Views and issues discussed at the WP1 workshop in Chester.

Views were explored on:	Issues discussed included:
Expectations or requirements of environmental protection (as a whole)	Challenges posed by practical application of environmental protection frameworks
Expectations or requirements of both chemical and radioactive approaches	Simplification of approaches
Suitability of any numerical values currently applied as criteria or standards.	Communication
Suitability of any approaches that derive numerical values for use as criteria or standards	Pressure from external parties (media, industry)
	Impact of scientific developments such as toxicogenomics
	Anticipated future legislative changes

The workshop provided valuable additional insight into environmental protection concepts and has allowed the consortium to clarify and focus on specific issues of concern.

Further information for WP1 has also been obtained through website searches, for example, legislative documents from various countries which detail protection goals.

All information is currently being assessed and summarised for Deliverable Report D3 (see WP1 Plans for Year 2).

Task 2 Review of the similarities and differences in approaches for chemicals and radioactive substances

The review also assessed similarities and differences in approaches for chemicals and radioactive substances. It evaluated the extent to which the existing approaches fulfil the objectives of environmental protection by looking at what endpoints are being applied, what is acceptable in terms of permitted risks, what levels of compliance is required for chemicals and radioactive substances (and are there any differences) and are there common themes in the application of approaches to chemicals and radioactive substances. Substantial input from chemical regulators and industry has not been forthcoming possibly because they perceive little benefit in replying. Instead, PROTECT has benefited from in-house chemicals assessment expertise and the perceptions of those in the radiological field (obtained either from the questionnaires or the Chester workshop). This review has been undertaken in parallel with Task 1 and all information obtained will also be assessed and summarised for Deliverable Report D3 (see WP1 Plans for Year 2).

WP1 Plans for Year 2

Deliverable Report D3 'A review of approaches to protection of the environment from chemicals and ionising radiation: Requirements and recommendations for a common framework' is pending in Month 14. A detailed time schedule for this deliverable was agreed upon at the meeting in Warrington, UK in Month 11 (Minutes No. 3) and should allow the various groups involved to coordinate their activities and finalise their work on time. No problems are currently envisaged in meeting this target.

2.2. Workpackage 2 Assessment approaches: practicality, relevance and merits

The main activity of WP2 within year 1 was focussed around the workshop in Vienna (June 2007). The workshop was attended by 13 independent experts including: developer/users of assessment approaches in Europe, the USA, Canada and Australia; a member of ICRP Committee 5; the IAEA. Consortium members attending the workshop also included those involved in the development of approaches in the UK and France, and representatives of previous relevant EC projects (ERICA, FASSET and EPIC). Specific objectives of the workshop were to:

- Discuss how the approaches are being used in assessments
- Identify areas which work well and those which require improvement
- Begin to assess the relevance (and applicability) of the approaches to third parties.

One aim of the workshop was to help assess the relative merits of some of the available approaches (in terms of complexity, fitness for purpose, cost and robustness) by applying them to a simple scenario. This also enabled an evaluation of their usability and transparency to groups other than those involved in their development.

Many of the available approaches (e.g. those used within the USA, England & Wales, Canada) use some form of tiered (or iterative) assessment. The first tier is a screening level approach wherein highly conservative criteria are applied, and further assessment, if required, moves through to comprehensive site specific evaluation. The three approaches readily available to third parties (i.e. RESRAD-BIOTA, the ERICA-Tool and the England & Wales Environment Agency's R&D128) were applied to a scenario based loosely upon data from an assessment conducted within the United Kingdom. The models all predicted that dose rate screening levels (which vary between the approaches) would be exceeded. However, different limiting radionuclides and organisms were identified by each model with maximum predicted dose rates ranging over two orders of magnitude:

- ERICA – highest dose rate (*circa* E3 μGy/h) predicted for insect larvae dominated by ^{234}Th
- R&D128 – highest dose rate (*circa* E3 μGy/h) predicted for amphibian dominated by ^{239}Pu
- RESRAD-BIOTA – ^{137}Cs was the only nuclide to result in a risk quotient (RQ) in excess of 1 (for riparian animal).

Subsequent investigation of the model parameters showed this to be due to differences in the concentration ratios and sediment-water distribution coefficients used in the models. The

outcomes of the workshop scenario led to the decision that PROTECT partners will compare the underlying parameters used in RESRAD-BIOTA, the ERICA-Tool and R&D128. This will be achieved by a simple 1 Bq per unit media scenario.

Towards the end of the reporting year work began in collating potential scenarios which could be used to compare human and ecological assessments as part of the evaluation (by WP3) of proposed benchmark values.

WP2 Plans for Year 2

The WP will complete the evaluation of the practicability of existing and developing approaches. A number of actions were identified during the Vienna workshop which will contribute to this:

- To compare the underlying parameters used in RESRAD-BIOTA, the ERICA-Tool and R&D128. To be achieved by a simple 1 Bq per unit media scenario.
- To try to document why different models use different default parameters.
- To investigate if PROTECT can provide a mechanism to establish the "degree of conservatism" in the models.
- To identify the most important data gaps.
- To evaluate further scenarios for application, including: U mine site; Savannah River, ^{3}H releases.

Workpackage 2 will also assist WP3 evaluations of levels of protection and benchmark values by applying different limits (i.e. numerical values to comply with) and looking at the consequences for the assessment process.

A second workshop with participation by experts external to the consortium will be held in January 2008. Activities during the workshop will include reporting of the actions identified during the Vienna workshop, application of approaches to scenarios and discussion of the initial evaluation of levels of protection and benchmark values identified by WP3.

The workpackage will report its findings in a deliverable due Month 22: *Evaluation of the practicability of different approaches for protecting the environment from ionising radiation in a regulatory context and their relative merits.*

2.3. Workpackage 3 Requirements for protection of the environment from ionising radiation

Activities under WP3 have only recently commenced. Initial discussions at the consortium meeting in Warrington focused on a number of key issues such as the aim of protection goals. There are a large range of protection goals and they are not mutually exclusive, protection goals identified by WP1 can be grouped as follows:

Protection Goal	Endpoint to measure	Accounting for:
Individual(rare and protected species/favourable conservation status)	Mortality/Morbidity/ Reproduction/Mutation	Each individual?
Population (protected species/favourable conservation status)	Mortality/Reproduction	Some loss of individual
'(Structure & function of) Ecosystem/habitat' (protected species/favourable conservation status/nature /biological diversity)	Mortality/Reproduction	Some loss of species/populations
'Environment' (nature/sustainable development?) Global goal which encompasses the above		

Methods of determining possible benchmark values which will be discussed include:

- Literature values (expert judgement)
- Assessment Factor
- Species Sensitivity Distribution
- Using background levels to determine bands of consideration (potential ICRP recommendation)

Workpackage 3 will consider deriving numbers by SSD and AF approaches as appropriate (using the ERICA projects FREDERICA database). We will consult with ICRP regarding the use of background and derived consideration levels. Literature (or 'expert judgement') values given by IAEA and UNSCEAR reports will be discussed.

The objectives of any target values to be proposed were also discussed at the Warrington meeting. Special attention was paid to the possibility of deriving a backstop number (i.e. an equivalent to the 1 mSv for the public) in addition to a screening value. WP3 needs to clarify the objective of such a backstop value, advantages and disadvantages, as well as the appropriate methods and criteria to derive it. This evaluation will inform a decision on whether a backstop number should be proposed by PROTECT partners.

WP3 Plans for Year 2

Decisions are to be taken on appropriate protection level, type(s) of value(s) to be derived (screening values, backstop values), and methods to derive these values. After derivation of these values, a draft version of deliverable 5B will be issued for web consultation with experts in month 16 (January 2008).

Proposed values will be provided to WP2 to allow an evaluation of the impact on the assessment process, e.g. to assess at what level a backstop number regarding environmental effects typically would become more limiting than a human risk assessment, as well as the overall consequences of different limits (i.e. numerical values to comply with).

A workshop to consult with external experts and presentation to a wider audience will be held in month 20 (May 2008) in Aix-en-Provence (France). It will be an open meeting to discuss suggested levels of protection and proposed target values to ensure protection level compliance. This workshop will be the final part of the consultation process of the draft version of deliverable 5B.

WP3 will report its final recommendations and proposals in Deliverable 5 due Month 24 (September 2008):

Aims, and associated secondary numerical targets, for protecting biota against radiation in the environment

A: Recommendations for further actions
B: Proposed levels and underlying reasoning
C: Records of end users' views on feasibility of proposed targets

3. Consortium Management

This section includes activities relating to WP4. There have been no significant management problems; slight delays in some activities (as detailed elsewhere) which will have no negative impact on the production of deliverables rather allowing more time for their considered preparation

Table 3.1 presents a revised project Gantt chart. The changes to those planned in the DoW are:

- Extension of WP1 information gathering to maximise questionnaire responses
- Extension of WP2 activity 'Comparison of approaches for regulatory purposes' to Month 17 as the Oslo workshop (Month 16) will be considering follow-up actions from the Vienna workshop under this task.
- Extension of tasks within WP3 to more logically fit to the due date of deliverable 4.
- Changes in delivery dates of D1 and D6 as discussed in Section 1 above.
- Revisions to workshop and meeting dates (see below).

These have no implications for the budget of partners. The contribution of each partner to the management of the CA has been as follow:

CEH – project initiation, management and activity reports, website, newsletters, communication action plan.

SSI – project initiation, contribution to management and activity reports.

EA – project initiation, contribution to management and activity reports.

NRPA – project initiation, contribution to management and activity reports.

IRSN – project initiation, contribution to management and activity reports, start to organise final workshop in Aix.

Table 3.1 Revised Gantt chart.

	Year 1												Year 2											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
WP 1 Environmental Protection Concepts																								
Gather information on regulatory approaches for chemicals and radioactive substances						W																		
Determine endpoints of protection, differences and similarities in approaches																								
Preparation of Deliverable 3														D3										
WP2 Assessment Approaches, Practicality, Relevance and Merits																								
Comparison of approaches for regulatory purposes									W															
Evaluation of numerical benchmarks																W								
Preparation of Deliverable 4																						D4		
WP3 Requirements for Protection of the Environment from Ionising Radiation																								
Interaction with WP1 to reach concensus on 'appropriate' protection level																								
Interaction with WP 2 on setting numerical benchmarks																								
Prepare draft Deliverable 5 Part B																								
Expert consultation																				W				
Finalisation of Deliverable 5																								D5
WP4 Management group																								
Preparation of annual & interim reports																							M	
Produce deliverables required by reporting procedures				D1		D2																		D7/8
Monitor and manage project progress	M										M					M							W	
Develop & maintain web site		D6																						

Changes to original scheduling are highlighted by red text and yellow cells.

3.1 Meeting and workshops

The first internal meeting of partners took place in Lancaster on 26th-27th October 2006 to schedule. The first expert consultation meeting took place in Chester on 29-30th March 2007 and was preceded by a meeting of partners to discuss consortium issues. The second expert consultation workshop took place in Vienna (27-29th June 2007). An additional one day meeting was held in Warrington (22nd August 2007) to discuss WP1 – WP3 interaction and plan WP3 activities.

In addition to these scheduled meetings, EA and CEH had two bilateral meetings to discuss organisation of the WP1 meeting in Chester scheduled for 29-30th March 2007.

Minutes from workshops and consortium meetings are in the public and consortium areas of the PROTECT website respectively.

Table 3.2 Places and revised timing of PROTECT consortium meetings.

Venue	*Host*	*Month*	*Expert groups*	*Objective*
Lancaster	CEH	Oct. 2006	No	Kick-off meeting
Chester	EA	March 2007	Regulators: nuclear & non-nuclear	WP1: Discuss regulatory approaches and requirements
Vienna	CEH	June 2007	Tool developers & users	WP2: Define approaches available & agree evaluation exercises
Warrington	EA	August 2007*	No	WP1 & WP3: Plan WP3 activities taking into account WP1 outputs
Oslo	NRPA	Jan. 2008*	Tool developers & users	WP2 (+WP4): Discuss outcomes & implications of evaluation exercises
Aix	IRSN	May 2008*	Regulators, industry, NGOs, scientific experts, tool developers	WP3 (+WP2): Consultation with external experts & presentation of different approaches to wider audience
Norway	NRPA	June 2008	n/a	Input into FUTURAE EUG event if required (PROTECT WP leaders only)
Lancaster	CEH	Aug. 2008	No	Finalise D5

*Additional or revised meeting dates.

3.2 Co-operation with other programmes

The PROTECT project has been represented at IAEA EMRAS Biota Working Group workshops, the BIOPROTA project (http://www.bioprota.com/) and the IAEA Co-ordinating Group on Radiation Protection of the Environment. In addition representatives of the IAEA and the ICRP (Committee 5) attended both expert consultations; OECD-NEA attended one of the workshops. The workshops have also enabled significant interaction with groups in Europe, North America and Australia who are developing environmental radiation protection frameworks. Consultations (questionnaire and workshops) have included industry.

PROTECT has maintained an interaction with the FUTURAE project and will input into the forthcoming FUTURAE deliverable 3 (*Rationalising radioecological capacity with requirements*).

Annex 1. Plan for using and disseminating knowledge

A.1 Promoting PROTECT

The PROTECT project will rely on a number of activities to promote the progress and disseminate its outputs. These are summarised in Table A.1.

Table A1.1 Overview of the PROTECT Projects communication activities

Dates	Type	Type of audience	Countries addressed	Size of audience	Partner responsible	Partners involved	Description
Nov.2006 (launch)	Website	Public; Research; Industry;	All	n/a	CEH	All	*Website with project description, all project outputs, draft discussion documents & tutorials, workshop reports and presentations and links to other relevant websites(radiological and chemical)*
Nov. 2006	Leaflet	Research; Industry; NGO's	All	>200	EA&CEH	All	*PROTECT project overview*
As appropriate	E-newsletter	All interested parties	All	>160 (email list) & placed on website	CEH	All	*Updates on the PROTECT project, notification of consultations etc.*
As appropriate	Questionnaire	Industry; stakeholders; NGO's	EU member states, USA, Canada, Australia, Russia, Norway, Switzerland	c.100	EA	All	*Questionnaire to elicit views on protection of the environment*
March 2007 - May 2008	Workshops (n=4)	Industry; Regulators; NGO's; Research community	Most EU member states, Norway, Russia, USA, Canada, Australia	c. 80	All partners	All	*Consultations during the course of PROTECT as specified in the DoW*
As appropriate	Journals	Research	n/a	n/a	All partners	All	*To publish the outputs of PROTECT in the peer reviewed literature*
As appropriate	Conferences & Posters	Research	n/a	n/a	All partners	All	*UK COGER (April 2007); Royal Society of Chemistry meeting on*

							Future Energy (Sept. 2007) *WPs 1,2,& 3 have each submitted abstracts to the 2008 International Conference on Radioecology and Environmental Radioactivity*
As appropriate	Interaction with other programmes	Industry; Regulators; NGO's; Research community	All	c. 100	CEH	All	***IAEA EMRAS Biota Working Group** – presentation and updates of PROTECT/ participation of PROTECT in BWG activities* *IAEA Co-ordinating Group on Radiation Protection of the Environment – PROTECT co-ordinator participates* *BIOPROTA – Industry supported group considering issues associated with waste repositories* *ICRP Committee 5 – members of C5 attend PROTECT workshops* *FUTURAE project – PROTECT will provide input into FUTURAE with regards to future radioecological priorities* *IUR Task Group on Waste*

A.2 Publishable results

No publishable results in this reporting period.