Cefas

Radiological Habits Survey: Hinkley Point, 2006

Public version

Environment Agency

FOOD STANDARDS AGENCY

HSE Health & Safety Executive

2007

Environment Report RL03/07

Radiological Habits Survey: Hinkley Point, 2006

Public version

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2007

Peer reviewed by B.D. Smith

The work described in this report was carried out under contract to the Environment Agency, the Food Standards Agency and the Health and Safety Executive.
Cefas contracts C1659, RB103 and C1666 respectively.
EA Project PO070206680, FSA Project RP0183 and HSE Project NS/X/374

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SUMMARY

This report presents the results of a survey conducted in 2006 into the habits and consumption patterns of people living, working and pursuing recreational activities in the vicinity of Hinkley Point A and Hinkley Point B nuclear power stations in Somerset. Hinkley Point A comprises twin Magnox reactors; the station ceased energy production in 2000 and is undergoing decommissioning. Hinkley Point B generates electricity from Advanced Gas-Cooled Reactors. The Hinkley Point site discharges gaseous radioactive wastes via separate stacks to the atmosphere, liquid radioactive wastes via separate outfalls into the Bristol Channel and contains sources of direct radiation.

The following potential exposure pathways related to the site were investigated:

- Consumption of locally sourced terrestrial foods
- Production, use and destination of local produce
- Consumption and use of groundwater and surface water
- Occupancy within 1 km of the site perimeter fence
- Consumption of locally sourced aquatic foods
- Occupancy of intertidal areas
- Handling fishing gear and sediment
- Occupancy in or on water
- Unusual practices such as the consumption and/or use of seaweed as fertiliser/soil conditioner and off-site transfer of contamination by wildlife

Individuals from the local population were interviewed and data collected for 358 individuals are presented and discussed.

Data from the survey are presented in full for each individual in order to assist in conducting dose assessments for multiple pathways. Additionally, data were analysed in three ways. Firstly by selecting potential critical group habits from the upper end of the distribution of observations (the 'cut-off' method). Secondly by using the 97.5th percentile from the

distribution of observations. These methods can be used to identify the highest rates appropriate to discrete habits in the aquatic and terrestrial pathways. Finally, profiles of integrated habits data were created for use in total dose assessments.

In the aquatic survey area, internal and external exposure pathways were investigated because of the potential effects from liquid discharges. Foods consumed from the aquatic survey area were fish, crustaceans, molluscs, wildfowl, marine plants/algae and salt marsh grazed sheep. For these foods, adult mean critical group consumption rates did not exceed the respective generic 97.5 percentile rates. Critical group intertidal occupancy rates were recorded for people undertaking houseboat dwelling, shore based set and stake netting, shore angling, bait digging, deckchair rental, walking, beach warden and marsh warden activities, farming, playing on the beach, bird watching, dog walking and fossil hunting. Critical group fishing gear and sediment handling rates were recorded for shore based set and stake net fishermen and a bait digger. People were undertaking water based activities such as boat angling, canoeing, jet skiing and sailing. The use of seaweed as a fertiliser for vegetables was identified.

In the terrestrial survey area, internal exposure pathways were investigated because of the potential effects from gaseous discharges. Food production was identified at 25 farms (including beef cattle, lamb, pigs, dairy cattle, chickens and arable), one allotment site and private gardens. Three beekeepers produced honey. One trout lake was identified from which a small amount of trout lake was consumed. For foods consumed from the terrestrial survey area, the mean critical group consumption rates exceeded the respective generic 97.5 percentile rates for green vegetables and other vegetables. Other local foods consumed were root vegetables, potato, domestic fruit, milk, cattle meat, pig meat, sheep meat (excluding salt marsh grazed sheep), poultry, eggs, wild/free foods, rabbits/hares, honey, wild fungi, venison and freshwater fish. The consumption of cereals was not found. The consumption of groundwater was identified; four households were using borehole water as their domestic supply. The consumption of surface water was not identified. Livestock were drinking borehole and surface water.

Investigations into the off-site transfer of radioactive contamination by wildlife established that although rabbits and pigeons were found on site, they were not considered by the site operators to be a problem within the perimeter fence. Members of the public who lived in the terrestrial survey area were consuming pigeons and rabbits that were shot within 5 km of the site.

In the direct radiation survey area, external pathways were investigated because of potential effects from ionising radiation emanating directly from the site and from exposure to gases discharged to atmosphere from the site. The highest outdoor occupancy rate was for a resident who also works at home, the highest indoor occupancy rate was for a resident. Occupancy rates were also recorded for people undertaking farming, beach activities and angling.

Comparisons are made with the results from the previous aquatic, terrestrial and direct radiation surveys, noting where different survey areas were used. Suggestions are made for changes to environmental monitoring programmes on the basis of the information collected during the survey.

1 INTRODUCTION

The public may be exposed to radiation as a result of the operations of the Hinkley Point site either from discharges of liquid or gaseous radioactive wastes into the local environment, or from radiation emanating directly from the site. This report provides information about activities carried out by members of the public under everyday circumstances, which may influence their radiation exposure. The study has been funded by the Environment Agency, the Food Standards Agency and the Health and Safety Executive in order to support their respective roles in protecting the public from the effects of radiation.

1.1 Regulatory framework

The Environment Agency regulates discharges of waste under the Radioactive Substances Act 1993 (RSA 93) (UK Parliament, 1993) as amended by: the Environment Act 1995 (EA 95) (UK Parliament, 1995a); by legislation implementing the European Union (EU) Basic Safety Standards (BSS) Directive 96/29/Euratom (CEC, 1996); and by the Energy Act 2004 (EA 04) (UK Parliament, 2004). The Directive takes into account Recommendations of the International Commission on Radiological Protection (ICRP), particularly ICRP 60 (ICRP, 1991). Authorisations under RSA 93 are issued by the Environment Agency after wide-ranging consultation, including the Food Standards Agency. As well as being a Statutory Consultee, the Food Standards Agency has responsibilities for ensuring that any radioactivity present in food does not compromise food safety and that authorised discharges of radioactivity do not result in unacceptable doses to consumers via the food chain. The Food Standards Agency also ensures that public radiation exposure via the food chain is within EU accepted limits. Consultation papers on Statutory Guidance to the Environment Agency on the regulation of radioactive waste discharges were issued by the Department of the Environment, Transport and the Regions (DETR) (now part of the Department for Environment, Food and Rural Affairs (Defra)) in 2000 (DETR, 2000a) and the Welsh Assembly in 2002 (The Welsh Assembly Government, 2002). These draft Guidance documents include, *inter alia*, affirmation that protection of the critical groups of the public is

the appropriate radiological protection methodology to use. This report provides information to support assessments of critical groups.

Installation and operation of certain prescribed activities can only take place on sites if they are licensed under the Nuclear Installations Act 1965 (as amended) (NIA 65) (UK Parliament, 1965). The Nuclear Installations Inspectorate of the Health and Safety Executive implements this legislation and is also responsible for regulating, under the Ionising Radiations Regulations (IRR 99) (UK Parliament, 1999), the restriction of exposure of the public to direct radiation from operations occurring on these sites.

1.2 Radiological protection framework

UK policy on the control of radiation exposure has long been based on the Recommendations of ICRP which embody the principles of justification of practices, optimisation of protection and dose limitation. Radiological protection of the public is based on the concept of a critical group of individuals. This group is defined as those people who, because of where they live and their habits, receive the highest radiation dose due to the operations of a site. It follows that, if the dose to this group is acceptable when compared to relevant dose limits and constraints, other members of the public will receive lower doses, and overall protection is provided for.

Dose standards for the public are embodied in national policy (UK Parliament, 1995b), in guidance from the International Atomic Energy Agency (IAEA), in the Basic Safety Standards for Radiation Protection (IAEA, 1996) and in European Community legislation in the EU BSS Directive 96/29/Euratom. The public dose standards were incorporated into UK law in IRR 99. In order to implement the Directive in England and Wales, the Environment Agency was issued with a direction by the DETR in 2000 (DETR, 2000b). This includes the requirements that the Environment Agency ensure, wherever applicable,

- all public radiation exposures from radioactive waste disposal are kept As Low As Reasonably Achievable (ALARA)

- the sum of such exposures does not exceed the dose limit of 1 mSv a year

The Environment Agency shall have regard for maximum doses to individuals for use at the planning stage:

- 0.3 mSv a year from any source
- 0.5 mSv a year from the discharges from any single site

The Environment Agency is also required to ensure that the dose estimates made are as realistic as possible for the population as a whole and for reference groups of the population. It is required to take all necessary steps to identify the reference groups of the population taking into account the effective pathways of transmission of radioactive substances. Guidance on the principles underlying prospective radiological assessment (i.e. assessments of potential future doses) has been provided by a group of UK Government Bodies (EA, SEPA, DoENI, NRPB and FSA, 2002). The National Dose Assessment Working Group (NDAWG) has also published principles underlying retrospective radiological assessment (i.e. assessment of doses already received from past discharges) (Allot, 2005) and possible methods of carrying out retrospective assessments of doses to the public using information provided by combined habits surveys (Camplin *et al.,* 2005). NDAWG agreed that the optimal method for performing retrospective dose assessments would be to use habits profiles (profiling method). This approach has now been applied around nuclear sites in the UK in recent RIFE publications – as combined habits surveys are completed.

This report provides information that allows the habits of members of the public to be quantified so that the most exposed groups can be identified and doses to the groups can be assessed in a realistic way.

2 THE SURVEY

2.1 Site activity

The Hinkley Point site is located on the North Somerset coast approximately 9 km north-west of the town of Bridgwater (see Figure 1). There are two nuclear power stations next to each other, Hinkley Point A and Hinkley Point B, which are considered as a single site for the purposes of this survey. Hinkley Point A has twin Magnox reactors, which ceased energy production in 2000. Defuelling was completed in 2004 and since then the station has been undergoing decommissioning. Hinkley Point B generates electricity from Advanced Gas-Cooled Reactors. The Hinkley Point site discharges gaseous radioactive wastes via separate stacks to the atmosphere, liquid radioactive wastes via separate outfalls into the Bristol Channel and contains sources of direct radiation. Details of the amounts of gaseous and liquid radioactive waste discharged in 2005 have been published (EA, EHS, FSA and SEPA, 2006). Whilst the habits survey fieldwork was being carried out, regular decommissioning activities were taking place at Hinkley Point A, and at Hinkley Point B three of the four reactors were generating electricity, with the other reactor offline for the whole period of the survey.

Hinkley Point A is owned by the Nuclear Decommissioning Authority (NDA). Magnox Electric Ltd. (itself a wholly owned subsidiary of British Nuclear Group (BNG)) is responsible for the day-to-day operations of the station. BNG is the station management company who provide employees at management and, where appropriate, other levels to Magnox Electric Ltd. Magnox Electric Ltd. employs all other staff. Hinkley Point B is owned and operated by British Energy Generation Ltd. Under NIA 65, the holder of the site licence for Hinkley Point A is Magnox Electric Ltd. and for Hinkley Point B it is British Energy Generation Ltd., which allows the installation and operation of certain activities. Under RSA 93, they are authorised to discharge gaseous radioactive wastes via separate stacks to the atmosphere and liquid radioactive wastes via separate outfalls into the Bristol Channel.

2.2 Survey objectives

The Centre for Environment, Fisheries & Aquaculture Science (Cefas) undertook the survey in 2006 on behalf of the Environment Agency, the Food Standards Agency, and the Health and Safety Executive. The aim of the survey was to obtain integrated habits data related to public radiation exposure from the Hinkley Point site via aquatic, terrestrial and direct radiation pathways in order to permit realistic assessments of critical group doses. Fieldwork was undertaken in order to obtain site specific habits survey data. These data were used to establish exposure pathways for the local population and the characteristics of those most exposed. General habits survey information, such as the number and types of farms or number of angling clubs in the area was also obtained.

Investigations were carried out to ascertain the extent of the following:

- Consumption of food from the terrestrial survey area
- The production, use and destination of local produce
- Consumption and use of groundwater and surface water in the terrestrial survey area
- Occupancy within 1 km of the site perimeter fence
- Consumption of food from the aquatic survey area
- Activities and occupancy rates over intertidal substrates
- Handling rates of fishing gear and sediment
- Activities and occupancy rates in and on water
- Any unusual practices such as the use of seaweed as a fertiliser or livestock feed and the transfer of contamination off-site by wildlife

There were no additional site-specific investigations identified by the Environment Agency, the Food Standards Agency or the Health and Safety Executive for the Hinkley Point survey.

The last aquatic habits survey conducted by Cefas in the Hinkley Point area was in 2000 (Tipple *et al*., 2001). The last terrestrial habits survey conducted by Cefas in the Hinkley Point area was also in 2000 (Caldwell and Tipple, 2000). The last direct radiation survey

conducted by Cefas in the Hinkley Point area was in 1995 (unpublished data). Data from the aquatic survey are used for dose assessments for the Hinkley Point area (e.g. EA, EHS, FSA and SEPA, 2006).

2.3 Survey areas

Three survey areas were defined to encompass the dominant activities expected for aquatic, terrestrial and direct radiation pathways.

The aquatic survey area, shown in Figure 1, extended from Brean Down to Blue Anchor on the southern shore of the Bristol Channel. It encompassed all intertidal areas including the tidal reaches of the River Parrett and River Brue, and fisheries up to 9 km from the shore. The same area was used in the 2000 survey and was based on hydrographic survey information. The area is relevant to the potential affects of liquid discharges from the site.

The terrestrial survey area, shown in Figure 2, was defined as the circle to a radius of 5 km from the centre of the Hinkley Point site (NGR ST 211 460) to encompass the main areas of potential deposition from gaseous discharges. The same area was used in the 2000 survey. Watercourses and areas potentially containing contamination only from washout of gaseous discharges are discussed in the terrestrial section of this report.

The direct radiation survey area is also shown in Figure 2. The Hinkley Point site comprises two licensed sites containing Hinkley Point A and Hinkley Point B. There are separate perimeter fences around the two licensed sites, though in part they are shared. The direct radiation survey area was defined as the area within 1 km of the overall external perimeter fence of the two licensed sites, which thus excluded the shared boundary. The 1995 direct radiation survey area was defined as being within 1 km of the Hinkley Point A perimeter fence.

2.4 Conduct of the survey

Prior to the fieldwork, discussions were held between a member of the Cefas survey team and representatives from Hinkley Point A and B, the Environment Agency, the Food Standards Agency and the Health and Safety Executive. These discussions provided an outline of the main aims of the survey and highlighted areas or items, which required special attention or effort by the team.

As part of the pre-survey preparation, people with a local knowledge of the survey area were contacted for information on any aspects relevant to the various exposure pathways. These included; people at local councils and the Tourist Information Centre; representatives from beekeeping associations and the British Association for Shooting and Conservation; commercial fishermen, local Marine Fisheries Agency (formerly the Sea Fisheries Inspectorate) officers and local Sea Fisheries Committee officers. These people provided information on allotments, beekeeping, wildfowling, commercial and non-commercial fishing and other activities in the aquatic survey area. Further information regarding the habits of people in the aquatic and terrestrial survey areas was obtained from Internet searches, Ordnance Survey maps and from previous habits surveys undertaken at Hinkley Point. A proposed programme for fieldwork was sent to the Environment Agency, the Food Standards Agency, and the Health and Safety Executive before the survey for comment.

The fieldwork component of the survey was carried out from 22nd May – 3rd June 2006 by a survey team of three people, according to techniques described by Leonard *et al.* (1982). At the start of the fieldwork, on 23rd May, a meeting was held between the survey team, representatives of Hinkley Point A and B, and a representative of the Environment Agency. This served to provide details about Hinkley Point A and B site operations, including waste disposal, and information about potential pathways and activities in the area. Details obtained are as follows:

- Hinkley Point A and B sites used to share the same pipeline for liquid discharges but they now have separate pipelines.

- Usual site activities were expected during the habits survey, with the exception of one reactor being offline at B site.
- Information about potential pathways and activities in the area included; limpets had been found in the area; no commercial bait digging; fossil hunting thought to be popular; elver fishing occurs; RNLI and coastguard locations; abundance of holiday camps and tourists in the aquatic survey area; trout lake in Burton; mixed farming in the terrestrial survey area.

The site representatives were also asked about any wildlife studies and pest control measures in and immediately around the site. Animals could be carriers for transporting radioactive materials off-site and are also potential food items for some individuals (See Section 5.2).

During the fieldwork, individuals who were identified in the pre-survey preparation as having the potential to be exposed to radioactivity from the site were contacted and interviewed. Interviews were used to establish individuals' consumption rates of locally grown terrestrial foods and locally caught seafood, their handling rates of intertidal sediments and fishing gear, their occupancy rates relevant to external exposure, and occupancy rates in and on water. Any general information of possible use to the survey was also obtained. Using the information gained in the interviews, a list of occupations and activities was built up to produce a picture of potential exposure pathways. This then enabled emphasis to be placed on those individuals who were likely to be the most exposed, including commercial fishermen, boat owners, anglers, farmers, beekeepers and people living and/or working close to the site.

The survey did not involve the whole population in the vicinity of Hinkley Point, but targeted subsets or groups, chosen in order to identify those individuals potentially most exposed. However, it is possible that even within a subset or group there may have been people not interviewed during the survey. Therefore, to aid interpretation, the number of people for whom data were obtained in each group as a percentage of what is estimated to be complete coverage for that group has been calculated where possible. The results are summarised in

Table 1. The ‘groups’ are described and quantified, and the numbers of people for whom data were obtained are given as percentages of the estimated totals. For certain groups, such as anglers, it can be virtually impossible to calculate the total number of people who undertake the activity in the survey area as many people visit from outside or only visit occasionally during the year. Overall, although the number of potential interviewees in the terrestrial survey area was estimated to be 1900, and several thousand may use the aquatic survey area, information was obtained for a significantly smaller number than this. In particular, it should be noted that the survey did not include site employees, or contractors that were working on site. This is because dose criteria applicable to these people whilst at work and the dose assessment methods are different to those for members of the public.

For each of the three survey areas, the survey targeted pathways primarily relevant to that survey area. Where possible, people were asked about habits relating to the other two survey areas. People in the terrestrial survey were initially questioned because it was known that they grew significant quantities of terrestrial foodstuffs. However, they were also asked about habits that might also lead to exposure to liquid discharges and direct radiation. During interviews with representatives from the Royal National Lifeboat Institution (RNLI), it was not possible to collect data for all pathways (such as consumption of local foods) for each person. In this case, data were limited to occupancy rates on water for RNLI volunteers. In Annexes 1 and 2 these individuals only have data for the pathway of primary interest.

Thirty-nine person-days were spent investigating the survey areas and interviewing individuals who were relevant to the survey. Observations for 358 individuals were recorded. During the survey, gamma dose rate measurements were taken to aid assessment of external exposure pathways.

3 METHODS FOR DATA ANALYSIS

3.1 Data recording

Data collected during the fieldwork were recorded in logbooks. On return to the laboratory, the data were examined and any notably high rates were double-checked, where possible, by way of a follow-up phone call. In rare cases where follow up phone calls were not possible (e.g. interviewees who wished to remain anonymous), the data were accepted at face value. The raw data were entered into a habits survey database where each individual for whom information was obtained was given a unique identifier (the observation number) to assist in maintaining data quality.

During the interviews, people could not always provide consumption rates in kilograms per year for food or litres per year for milk. In these cases, interviewees were asked to provide the information in a different format. For example, some estimated the size and number of items, (e.g. eggs) consumed per year, whereas others gave the number of plants in a crop or the length and number of rows in which the crop was grown per year. The database converted these data into consumption rates (kg/y for food and l/y for milk) using a variety of conversion factors. These factors included produce weights (Hessayon, 1990 and 1997 and Good Housekeeping, 1994), edible fraction data researched by Cefas, and information supplied by the Meat and Livestock Commission. For the purpose of data analysis, foodstuffs were aggregated into food groups as identified in Table 2. Specific food types relevant to this survey are presented in the subsequent tables.

All consumption and occupancy data in the text of this report are rounded to two significant figures to reflect the authors' judgement on the accuracy of the methods used. In the tables and annexes, the consumption rate data are usually presented to one decimal place. Occasionally, this rounding process causes the row totals or mean rates to appear slightly erroneous ($\pm$ 0.1). Consumption rates less than 0.05 kg/y are presented to two decimal

places in order to avoid them appearing as 0.0 kg/y. External exposure data are quoted as integers.

To ensure the quality of the data collected during the survey fieldwork and presented in the report, the following procedures have been employed:

- Experienced scientific staff were used for fieldwork and data assessment. They had been trained in the techniques of interviewing and obtaining data for all pathways that were relevant to the survey being conducted. Where individuals offered information during interview that was unusual, they were questioned further in order to double-check the validity of their claims.
- Where possible, interviewees were contacted again to confirm the results of the initial interview if, when final consumption or occupancy rates were calculated, observations were found to be high in relation to our experience of other surveys. Local factors were taken into account in these cases.
- Data were manipulated in a database using a consistent set of conversion factors.
- Data were stored in a database in order to minimise transcription and other errors.
- Draft reports and data tables were formally reviewed by an experienced consultant in radiological protection.
- Final reports were only issued when the Environment Agency, the Food Standards Agency and the Health and Safety Executive were entirely satisfied with the format and content of the draft.

The habits data are structured into groups of activities with similar attributes. For example, when considering terrestrial food consumption, all types of root vegetables are grouped together in a food group called ‘root vegetables’. Similarly, for aquatic food consumption, all crustacean species are grouped as ‘crustaceans’. For external exposure over intertidal sediments, occupancy over a common substrate (e.g. sand) is chosen. The choice of a group of activities is made when it is reasonable to assume that consistent concentrations or dose rates would apply to that group.

In addition to grouping of activities, ingestion data are structured into age groups because different dose coefficients (i.e. the factors which convert intakes of radioactivity into dose) can apply to different ages. These age groups are from 0 to 1.0 y of age (called 3 month old); more than 1.0 y to 2.0 y (called 1 year old); more than 2.0 y to 7.0 y (called 5 year old); more than 7.0 y to 12.0 y (called 10 year old); more than 12.0 y to 17.0 y (called 15 year old). Individuals over 17 years old are treated as adults. These age groupings are consistent with those used in ICRP 72 (ICRP, 1996). For direct radiation pathways, the data are grouped into distance zones from the site perimeter as a coarse indication of the potential dose rate distribution due to this source of exposure. The bands used were: 0 – 0.25 km, >0.25 – 0.5 km and >0.5 – 1 km. These distance bands are also useful when assessing exposure to gaseous discharges.

3.2 Data analysis

The main outputs of the study are the statements of individuals' consumption, handling and occupancy rates given in Annexes 1 and 2. These can be used by those undertaking radiological assessments of the effects of the operations at the Hinkley Point site – taking into account the concentrations and/or dose rate distributions in space and time relevant to the assessments. It is only with the outcome of such assessments that the critical group can strictly be defined as those most exposed.

Annex 3 contains qualitative and estimated data for pathways where it was not possible to obtain quantifiable data from interviews. This includes activities that were heard about during the survey e.g. activities which were taking place at a different time of year to the survey. Annex 3 has been included in this report so that the information can be used in dose assessments, thereby ensuring that all potential pathways have been covered in the assessments that would otherwise be missed. An estimated rate has been given for occupancy over mud for elver fishermen, based on experience from previous habits surveys. Elver fishing was taking place at a different time of year to the survey and although

information was gained during the survey that the activity was taking place, no one was available for interview.

In addition to providing data in the annexes, we have also analysed them to provide estimates of rates of occupancy, handling and consumption which can be regarded as typical of those most exposed prior to a formal assessment being undertaken. Three approaches have been used.

Firstly, the 'cut-off' method described by Hunt *et al.* (1982) was used. With the 'cut-off' method, the appropriate high rate was calculated by taking the arithmetic mean of the maximum observed rate and all observed rates within a factor of 3 of the maximum value (termed the lower threshold value). It accords with the principle expressed by ICRP (ICRP, 1984) that the critical group should be small enough to be reasonably homogeneous with respect to age, diet and those aspects of behaviour that affect the doses received. In this report, the term critical group rate is used to represent the data derived by the 'cut-off' method for ease of presentation. A separate critical group rate was calculated for each food group, intertidal substrate and handling pathway identified in the survey. In certain cases, using the 'cut-off' method could result in only one person being in the critical group. In these cases, expert judgement was used to decide whether the critical group should remain as one individual or whether others should be included. If others were included, the second highest rate was divided by three to give a new cut-off value and all observations above this were included in the critical group. When the second highest rate has been used, this is explained in the table notes.

Secondly, 97.5 percentile rates were calculated using the Excel mathematical function for calculating percentiles. This method accords with precedents used in risk assessment of the safety of food consumption. Mean and 97.5 percentile rates based on national statistics have been derived by the Ministry of Agriculture, Fisheries and Food (MAFF) (now part of Defra) and the Food Standards Agency (Byrom *et al.,* 1995 and FSA, 2002), and these are referred to as generic rates in this report.

Thirdly, data has been profiled using the ‘cut-off’ approach. This gives a complete view of the habits of the individual that might lead to exposure to all the discharges and radiation from the site. The profiled data has been used to assess total dose integrated across all pathways of exposure.

For ingestion pathways, critical group rates for children have been calculated from the survey data. However, because few child consumers were identified, the rates should be viewed with caution. For assessment purposes, an alternative approach may be taken which involves scaling the critical group rates for adults by ratios. These ratios are given in Annex 4 and have been calculated using generic 97.5 percentile consumption rates.

Selection of critical group and 97.5 percentile rates for occupancy is not made for the direct radiation pathway. Such an analysis is of limited value without a detailed knowledge of the spatial extent of dose rates due to direct radiation.

4 AQUATIC RADIATION PATHWAYS

4.1 Aquatic survey area

The aquatic survey area (Figure 1) extended from Brean Down to Blue Anchor on the southern shore of the Bristol Channel. It encompassed all intertidal areas including the tidal reaches of the River Parrett as far as Bridgwater and the River Brue as far as the New Clyce Bridge. Fisheries up to 9 km from the shore were also included.

Overview of survey area

The intertidal area of the coastline between Brean Down and Lilstock was predominantly mud and sand, and between Lilstock and Blue Anchor it was stone and rock interspersed with mud and sand. The area has a large tidal range, resulting in fast running water and large areas of exposed mud and sand. Beach and water activities were restricted at some locations due to the dangerous nature of the soft mud and sand, and the strong tides. The Bridgwater Bay National Nature Reserve (NNR), managed by English Nature, covered the intertidal area from Burnham-on-Sea to Lilstock including the lower reaches of the River Parrett.

Brean Down, Brean and Berrow

Brean Down, a rocky headland extending 2 km offshore, marked the northern most part of the aquatic survey area. The mud and sand beach at the base of the headland was accessible to the public at low tide but climbing the cliffs was not permitted. From Brean Down the beach extended continuously south, 11 km in length, encompassing the areas of Brean, Berrow and Burnham-on-Sea. The beaches at Brean and Berrow were firm sand on the upper foreshore and soft mud and sand on the mid to lower foreshore. Berrow Flats was a vast expanse of mud flats exposed at low tide, varying from 2 to 4 km offshore between Brean Down and Burnham-on-Sea. The coastal road through Brean was lined with holiday camps and caravan sites. During the survey, on days with good weather, Brean and Berrow were bustling with

tourists and approximately 100 people, mostly tourists, were observed on both Brean and Berrow beaches. Observed activities were predominantly families playing and walking as well as people horse riding, angling and canoeing. Beach wardens patrolled Brean and Berrow beaches between May and September.

Burnham-on-Sea

South of Berrow is Burnham-on-Sea, a popular seaside town with good road access and parking. The beach was sandy near the high water mark, and mud and sand on the mid to lower foreshore; at the southern most part of the beach at the mouth of the River Brue the substrate switched to mud and salt marsh. During the survey, it was not uncommon to observe approximately 50 people on the beach. Activities included families playing, paddling, kite flying, shore angling and jet skiing. Dog walking was banned on the main beach all year round and on the north and south areas of Burnham-on-Sea Beach from May to September. Commercial and non-commercial bait digging were noted on Burnham-on-Sea Beach at low tide. People were operating donkey rides and deck chair rentals on the upper foreshore between May and September. There was a public slipway, which people used to launch boats, yachts and jet skis. A lifeguard lookout station, which was manned from May to September, was located near the slipway. The RNLI, coast guard and hovercraft rescue were also located in the vicinity of the slipway and due to the soft mud and fast tides, had regular call outs throughout the year in the Bridgwater Bay area.

River Brue and River Parrett

The River Brue is located at the southern end of Burnham-on-Sea and was tidal up to the sluices at New Clyce Bridge, Highbridge. The river had a large tidal range, steep soft mud banks and salt marsh on the tops of the banks. The river was accessible to the public by footpath along the riverbank from Burnham-on-Sea to Highbridge; the footpath was not tide washed. Private moorings were situated along the river banks up to the New Clyce Bridge for sailboats and angling boats less than 30 feet long. The Burnham-on-Sea sailing club with

approximately 140 members moored their boats on banks of the River Brue; their members raced regularly in the River Parrett and between Burnham-on-Sea and Watchet. A boat yard had a private slipway and it was reported that several jet skiers launched from the slipway on the River Brue most weekends in summer; no one was observed jet skiing during the survey.

The River Parrett was not accessible by car for the most part, because of private access to farmland. There was a public footpath that ran along the eastern bank of the river from Burnham-on-Sea to Dunball and a footpath along the western bank of the river from North Clyce to Bridgwater. At low tide, a channel of water from the confluence of the River Brue and River Parrett still separated Berrow Flats and Stert Flats. From the confluence with the River Brue, the River Parrett extended south and was tidal for approximately 40 km. There were areas of salt marsh on the east and west banks, 3 km from the mouth of the river. One wildfowling club had the rights to shoot on the salt marsh on the west bank.

The main activity on the River Parrett was sailing. A sailing club was based at the village of Combwich; seven sailboats were observed moored in the river and 15 boats were observed in the club car park. The sailing club from Burnham-on-Sea regularly used this area for sailing competitions. Around Bridgwater the river was not very accessible because of steep muddy banks that would make bank side activities treacherous. The only activities that were identified taking place on the muddy riverbanks were elver (young eel) fishing and EA river bailiff duties. Elver fishing was a lucrative activity that occurred on the River Parrett, mainly upriver of Bridgwater where freshwater flows into the tidal water.

Steart Village and Stolford

The Steart village is located on a peninsula to the west of the River Parrett. Stert Point, which marks the tip of the peninsula, was a popular area for bird watchers; however, the bird hides were not on tide washed areas. To the west of Stert Point, the shore was backed with salt marsh. A farmer at Steart village grazed sheep on the salt marsh, which were being sold and consumed locally. A marsh warden also spent time on the salt marsh. The upper foreshore

was predominantly sand and observed activities were dog walking, bird watching and families playing on the beach. Stert Flats was a vast expanse of mud flats and sand flats exposed at low tide. The mud flats and sand flats encompassed the area from Burnham-on-Sea to Hinkley Point, with an offshore extent of between 2 and 3 km.

On many occasions during the survey, cars were observed in the car park at Stolford village, however, people were walking along the coastal path from Stolford to Hinkley Point, which was on the upper landward side of the beach and was not tide washed. The beach at Stolford was mud and sand with rocky outcrops and areas of salt marsh. Two commercial fishermen operated set nets and stake nets approximately 1 km offshore on the mud flats. One of these fishermen sold fish from his house in the village and collected and consumed a small amount of whelks (*Buccinum undatum*). Two people collected seaweed at Stolford to use as fertiliser on their vegetable gardens. One local farmer grazed sheep on the salt marsh area between Steart village and Stolford.

Hinkley Point, Shurton Bars and Lilstock

There was one access road along the western side of the Hinkley Point site down to the shore; however, this road was closed at the time of the survey due to site operations. A coastal footpath, which was not tide washed, ran parallel to the shore from Stolford past the site to Lilstock. Large sea defence boulders lined the upper foreshore at Hinkley Point, hindering access to the beach from the path; there was one set of steps from the path to the beach in front of the site. The beach was predominantly mud and sand with rocky outcrops and stone on the upper foreshore. The outcrops were reported to be popular with anglers mainly in the winter for cod, especially at weekends. Anglers and one beachcomber were noted on the beach at Hinkley Point, no one else was observed at the time of the survey.

The coastline between Hinkley Point and Lilstock was predominantly rocky outcrops with areas of mud and sand backed by cliffs. Shurton Bars, a shallow water inshore reef, was

popular with anglers but no activities were observed during the survey. Access to Shurton Bars was by farm tracks or by footpath from Hinkley Point or Lilstock.

The beach at Lilstock was predominantly stone on the upper foreshore and rock, mud and sand on the lower foreshore. The tidal range was smaller than the area around Stolford and Stert Flats. There was road access and a car park, which was two hundred metres from the beach. Beach activities at Lilstock included walking, dog walking and angling.

Kilve, St Audrie's Bay and Doniford

Intertidal activities between Lilstock and St Audrie's Bay were limited due to the lack of roads leading to the coast. The foreshore between Lilstock and Kilve was backed by cliffs of shale and limestone and was a well-known location for collecting fossils. There was road access to Kilve Beach, which was predominantly stone and rock with areas of mud and sand at low tide. Anglers were fishing from rocky reefs. Kilve Beach was popular with people having picnics, walkers, dog walkers and fossil collectors, and there was car parking near the beach.

St Audrie's Bay was a large sandy bay with rocky reefs and cliffs on the east and west sides. The beach was only accessible through a holiday village and caravan park. As a consequence, tourists were the only people observed on the beach.

The road down to the car park and shore at Doniford was concealed by bushes so was quite hard to find; there was also a steep decent from the car park to the beach. The beach substrate was mud, sand and stone, and sloping shelves of rocky reefs. Mainly tourists and locals dog walking and walking were observed. Donisford was reported to be a popular angling spot for cod in the winter from the rocky reefs.

Watchet Harbour and Blue Anchor

Watchet Harbour was tidal, and at low tide the outer harbour dried out completely and the inner harbour had areas of exposed mud. The harbour had 180 permanent berths and 70 berths for visiting boats. The berths accommodated boats up to 65 ft in length. Two angling charter boats and six houseboats were based at Watchet Harbour. The Watchet coastguard was also based at the harbour and operated along the coast between Blue Anchor and Steart village. It was noted that angling was taking place from the harbour wall. The beaches to the east and west of Watchet Harbour were sand, mud, stone and rock, and were accessible to the public through the harbour.

After Watchet Harbour and approximately 1 km east of Blue Anchor, the coastline changed from being predominantly rock with mud and sand to being stone on the upper foreshore and mud and sand on the lower foreshore. At Blue Anchor a road ran parallel with the beach; the landward side of the road was lined with caravan parks. People using the beach were mainly from the caravan parks; children were observed playing on the beach and activities included angling, dog walking and bait digging. Two commercial fishermen had stake nets on the beach at Blue Anchor. Two hobby fishermen were longlining and one hobby fisherman was push netting and stake netting from the shore at Blue Anchor.

4.2 Commercial fisheries

There were scarcely any commercial fishing activities in the survey area. Five full time commercial fishermen were identified as working in the survey area. Three commercial fishermen were operating stake nets and set nets on Stert Flats at Stolford. Their stake nets were used to catch cod (*Gadus morhua*) in winter and bass (*Dicentrarchus labrax*), grey mullet (*Chelon labrosus*) and eel (*Anguilla anguilla*) in summer. Because Stert Flats was within the Bridgwater Bay National Nature Reserve, English Nature issued the licences. Two commercial fishermen were operating stake nets at Blue Anchor, west of the Bridgwater Bay National Nature Reserve. These fishermen were using stake nets for cod in winter and for

thornback ray (*Raja clavata*) and bass in summer and were licensed by the Marine Fisheries Agency. Fishing methods had decreased in 2006 compared with the 2000 survey; trawling and drift netting were identified in 2000 but not in 2006. Two additional fishermen were interviewed at Watchet Harbour, who both had commercial fishing licences but were not fishing at present.

Elver fishing was a popular activity on the River Parrett. The season for elvers was January/February to March/April depending on environmental conditions. Information about elver fishing was gained from Environment Agency staff and local people because it was not elver season at the time of the survey. Approximately 140 elver fishing licences were issued by the Environment Agency for the River Parrett. It was reported that there were also people that undertook elver fishing without licences. The fishermen used dip nets with long handles while standing on the steep muddy banks of the river. Two tides were sometimes fished, but in general fishermen preferred the night tide. Elvers were sold to two companies who exported them live to Holland and Scandinavia to restock rivers and fish farms. It was reported that a few individuals outside the survey area might consume a few kilos of elvers per year, as they were considered to be a delicacy.

Commercial fishing for crustaceans was only identified at Stolford. Here, two fishermen were set netting over mud for brown shrimps (*Crangon crangon*). The commercial collection of molluscs was not identified in the survey area.

One commercial bait digger was identified digging for lugworm (*Arenicola marina*) at Burnham-on-Sea and Berrow beaches at low tide over mud and sand. No other commercial bait diggers were identified.

4.3 Angling and hobby fishing

Shore angling was a popular activity on many of the beaches in the survey area. People were observed angling at Brean, Burnham-on-Sea, Shurton Bars, Lilstock, Kilve, Doniford, Watchet Harbour and Blue Anchor. Representatives from three angling clubs were interviewed. Each club had approximately 50 keen members who were regular anglers and who took part in competitions in the survey area. Many anglers that were interviewed said angling was more popular in the winter months than it was at the time of the survey. A small number of boat anglers were interviewed during the survey, and a few individuals were angling from sailing boats. Two angling charter boats were operating from Watchet Harbour, taking regular inshore angling trips along the coast between Blue Anchor and Stert Flats.

The most abundant fish species caught by shore anglers in the area in the winter were cod and whiting *(Merlangius merlangus)*, and in the summer were bass, pollack (*Pollachius pollachuis*), spurdog (*Squalus acanthias*) and thornback ray. Boat anglers were catching cod and whiting in winter and thornback ray, conger eel (*Conger conger*), lesser spotted dogfish (*Scyliorhinus caniculus*), flounder (*Platichthys flesus*), Dover sole (*Solea solea*), bass and mackerel (*Scomber scombrus*) in summer.

Two hobby fishermen were longlining from the shore at Blue Anchor for thornback ray. Their catches were consumed by the fishermen and their families. One hobby fisherman had set nets on stakes catching thornback ray, and push nets for catching common prawns (*Palaemon serratus*). The catches were consumed by the fishermen and given to family and friends.

The only individual fishing for crustaceans non-commercially was the hobby fisherman, mentioned above, catching common prawns. The only molluscs being collected non-commercially were whelks; a commercial fisherman was collecting a very small amount of whelks on the shore at Stolford for his and his son's consumption.

4.4 Wildfowling

Two wildfowling clubs were identified that were shooting in the area between Brean Down and the River Parrett. Members of only one club were available for interview. This club was mainly shooting under permit from English Nature on salt marsh along the west side of the River Parrett, east of Steart village. The main species being shot were mallard (*Anas platyrhynchus*), teal (*Anas* crecca) and wigeon (*Anas penelope*) as well as pintail (*Anas acuta*), pochard (*Aythya farina)* and gadwall (*Anas strepera)*.

4.5 Other Pathways

Two people were consuming *Porphyra umbilicalis*, one of which was also consuming sea lettuce (*Ulva lactuca*); both species were collected from Stolford. Two people were using seaweed from Stolford as fertilizer on their vegetable gardens. No one was identified who used seaweed for animal feed.

Two farmers in the aquatic survey area were grazing livestock on salt marsh. One of these farmers grazed beef cattle and sheep on salt marsh between Stolford and Steart village; the salt marsh area around Stolford was also in the terrestrial survey area. This farmer's livestock was sold to Taunton market and no one in the survey area was found to be consuming beef or lamb from this farm. The other farmer was grazing sheep on salt marsh at Steart village between May and September. This farmer's lamb was sold nationally through a meat company and nine people from the survey area were identified as consuming salt marsh grazed lamb from this farm.

No other unusual pathways were identified.

4.6 Wholesalers and retailers

A fisherman at Stolford sold locally caught fish and brown shrimps from his house. No fish wholesalers or retailers were identified in the survey area. Elvers were being sold to two buyers and exported live to Europe, mainly Holland and Scandinavia, with a small amount going to China. The elvers were sold to restock rivers and fish farms, grown into eels and used for consumption. Salt marsh grazed lamb was sold from a farm in the aquatic survey area, through Taunton Market and to a national meat company.

4.7 Food consumption data

Consumption data for local aquatic foodstuffs and salt marsh grazed sheep are presented in Tables 3 to 8 for adults and in Tables 9 to 10 for children. The tables include the mean consumption rates of the critical groups together with the observed 97.5 percentile rates calculated as described in Section 3.2. For purposes of comparison, the data are summarised in Table 11 for adults and Tables 12 to 15 for children (15 year olds, 10 year olds, 5 year olds and 1 year olds respectively). The summary tables also include mean rates and 97.5 percentile rates based on national data (referred to as 'generic' data in this report). No generic data are available for the 5 year old and 1 year old age groups.

Adult consumption rates

Adults were found consuming foods from the following six food groups; fish, crustaceans, molluscs, wildfowl, marine plants/algae and salt marsh grazed sheep. The people consuming the greatest quantities of food from the aquatic survey area were commercial fishermen, shore anglers and families of these people.

The predominant species of fish consumed by adults were thornback ray, cod, whiting, conger eel and bass with smaller quantities of Dover sole, flounder, eel, grey mullet, herring (*Clupea harengus*), lesser spotted dogfish, mackerel, monkfish (*Lophius piscatorius*), plaice

(*Pleuronectes platessa*), sprats (*Sprattus sprattus*), spurdog and turbot (*Scophthalmus maximus*). A critical group of 15 individuals was identified with a maximum consumption rate of 69 kg/y and a mean of 40 kg/y. The observed 97.5 percentile rate based on 73 observations was 47 kg/y. This compares with the adult generic mean and 97.5 percentile consumption rates for fish of 15 kg/y and 40 kg/y respectively. The percentage breakdown of species eaten by the critical group was 45% thornback ray, 35% cod, 5% conger eel, 5% whiting, 5% bass and 5% other species as named in Table 3. These percentages, rounded to the nearest 5%, are based on the total amount of fish consumed by this critical group and exclude observations for 'mixed fish'.

Only two species of crustaceans were consumed by adults; brown shrimps predominantly, with a small amount of common prawns. A critical group of three individuals was identified with a maximum consumption rate of 15 kg/y and a mean of 12 kg/y. The observed 97.5 percentile rate based on 23 observations was 15 kg/y. This compares with the adult generic mean and 97.5 percentile consumption rates for crustaceans of 3.5 kg/y and 10 kg/y respectively. The critical group only ate brown shrimps.

The only species of molluscs consumed by adults was whelks. A critical group of two individuals was identified with a maximum consumption rate of 1.9 kg/y and a mean of 1.9 kg/y. The observed 97.5 percentile rate based on two observations was 1.9 kg/y. This compares with the adult generic mean and 97.5 percentile consumption rates for molluscs of 3.5 kg/y and 10 kg/y respectively. The critical group only ate whelks.

The species of wildfowl consumed by adults were mallard, teal and wigeon. A critical group of two individuals was identified with a maximum consumption rate of 9.7 kg/y and a mean of 6.4 kg/y. The observed 97.5 percentile rate based on nine observations was 8.4 kg/y. No generic data are available for this food group. The percentage breakdown of species, rounded to the nearest 5%, eaten by the critical group was 40% mallard, 35% teal and 25% wigeon.

The species of marine plants/algae consumed by adults were *Porphyra umbilicalis* and sea lettuce. A critical group of two individuals was identified with a maximum consumption rate of 2.2 kg/y and a mean of 2.0 kg/y. The observed 97.5 percentile rate based on two observations was 2.2 kg/y. No generic data are available for this food group. The percentage breakdown of species, rounded to the nearest 5%, eaten by the critical group was 90% *Porphyra umbilicalis*, 10% sea lettuce.

For salt marsh grazed lamb a critical group of two individuals was identified with a maximum consumption rate of 20 kg/y and a mean of 20 kg/y. The observed 97.5 percentile rate based on nine observations was 20 kg/y. No generic data are available specifically for salt marsh grazed lamb, however, a comparison can be made with generic consumption rates for lamb of which the adult generic mean and 97.5 percentile are 8.0 kg/y and 25 kg/y respectively.

Children's consumption rates

15 year old age group

Children in the 15 year old age group were found consuming fish and crustaceans. No consumption was identified for the following four food groups; molluscs, wildfowl, marine plants/algae and salt marsh grazed sheep.

For fish, a critical group of two individuals was identified with a maximum consumption rate of 24 kg/y and a mean of 18 kg/y. The observed 97.5 percentile rate based on three observations was 23 kg/y. This compares with the generic mean and 97.5 percentile consumption rates for fish of 6.5 kg/y and 20 kg/y respectively.

For crustaceans, a critical group of three individuals was identified with a maximum consumption rate of 1.6 kg/y and a mean of 1.6 kg/y. The observed 97.5 percentile rate based on three observations was 1.6 kg/y. This compares with the generic mean and 97.5 percentile consumption rates for crustaceans of 2.5 kg/y and 6.0 kg/y respectively.

10 year old age group

Children in the 10 year old age group were found consuming fish and crustaceans. No consumption was identified for the following four food groups: molluscs, wildfowl, marine plants/algae and salt marsh grazed sheep.

For fish, a critical group of three individuals was identified with a maximum consumption rate of 12 kg/y and a mean of 11 kg/y. The observed 97.5 percentile rate based on three observations was 12 kg/y. This compares with the generic mean and 97.5 percentile consumption rates for fish of 6.0 kg/y and 20 kg/y respectively.

For crustaceans, a critical group of two individuals was identified with a maximum consumption rate of 1.5 kg/y and a mean of 1.5 kg/y. The observed 97.5 percentile rate based on two observations was 1.5 kg/y. This compares with the generic mean and 97.5 percentile consumption rates for crustaceans of 2.5 kg/y and 7.0 kg/y respectively.

5 year old age group

Children in the 5 year old age group were found consuming fish. No consumption was identified for the following five food groups: crustaceans molluscs, wildfowl, marine plants/algae and salt marsh grazed sheep.

For fish, a critical group of one individual was identified with a consumption rate of 2.6 kg/y. The observed 97.5 percentile rate is not applicable for one observation. No generic consumption rates have been derived for this age group.

1 year old age group

Children in the 1 year old age group were found consuming fish. No consumption was identified for the following five food groups: crustaceans molluscs, wildfowl, marine plants/algae and salt marsh grazed sheep.

For fish, a critical group of one individual was identified with a consumption rate of 2.6 kg/y. The observed 97.5 percentile rate is not applicable for one observation. No generic consumption rates have been derived for this age group.

3 month old age group

No children in the 3 month old age group were noted to be consuming any local aquatic foodstuffs or salt marsh grazed sheep.

4.8 Intertidal occupancy

Intertidal occupancy rates for adults and children are presented in Table 16. The table includes data on occupancy over seven different types of substrate: mud; mud and sand; mud, sand and stones; rock; salt marsh; sand; sand and stones. Potential critical occupancies are shown in bold.

The maximum occupancy rate recorded over mud was 1600 h/y for two commercial shore based set net and stake net fishermen. One other commercial stake net fisherman had an occupancy rate within a factor of three of this. This gives a mean occupancy rate for this group of 1300 h/y.

The maximum occupancy rate recorded over mud and sand was 1500 h/y for two commercial shore based stake net fishermen. One angler, one individual who was bait digging commercially and angling, and one individual who was angling and walking had occupancy

rates within a factor of three of this. This gives a mean occupancy rate for this group of 1200 h/y.

The maximum occupancy rate recorded over mud, sand and stones was 180 h/y for two people playing on the beach. One person bird watching and dog walking, and three dog walkers had occupancy rates within a factor of three of this. This gives a mean occupancy rate for this group of 130 h/y.

The maximum occupancy rate recorded over rock was 100 h/y for two fossil hunters. Four anglers had occupancy rates within a factor of three of this. This gives a mean occupancy rate for this group of 74 h/y.

The maximum occupancy rate recorded over salt marsh was 520 h/y for a marsh warden. One farmer tending livestock had an occupancy rate within a factor of three of this. This gives a mean occupancy rate for this group of 380 h/y.

The maximum occupancy rate recorded over sand was 840 h/y for one individual renting deckchairs. Nine beach wardens and two dog walkers had occupancy rates within a factor of three of this. This gives a mean occupancy rate for this group of 540 h/y.

The maximum occupancy rate recorded over sand and stone was 670 h/y for an angler. No other individuals had occupancy rates within a factor of three of this, so the mean occupancy rate for this group is 670 h/y.

The maximum occupancy rate recorded for two occupants of a houseboat was 5000 h/y. Two other people that lived on separate houseboats had occupancy rates within a factor of three of this. This gives a mean occupancy rate for this group of 3700 h/y. The occupancy rates only account for time living on boats while the tide was out and the boats were grounded on mud.

Gamma dose rate measurements

Representative gamma dose rate measurements at 1 m above the substrate were taken over mud, mud and sand, salt marsh and sand. These measurements (shown in Table 17) ranged from 0.055 to 0.076 μGy/h over mud, 0.048 to 0.067 μGy/h over mud and sand, 0.066 to 0.084 μGy/h over salt marsh and 0.053 to 0.071 μGy/h over sand. Natural levels of around 0.05 μGy/h over sand and around 0.07 μGy/h over mud and salt marsh are expected. A value of 0.06 μGy/h is expected for all other substrate types. Gamma dose rate measurements were taken on a houseboat in Watchet Harbour (also shown in Table 17). The measurements were 0.055 μGy/h in the lower cabin and 0.068 μGy/h on the bridge.

4.9 Handling of sediment, fishing gear and nets

Handling sediment, while bait digging or mollusc collecting, or handling commercial fishing gear, which has become entrained with fine sediment particles can give rise to skin exposure from beta radiation. Doses to the skin need consideration as there is a separate dose limit for skin for members of the public. There is also a contribution to effective dose due to skin exposure (ICRP, 1991).

Handling of angling equipment was not considered to be a significant pathway. Therefore, as in previous surveys, data for this pathway were not collected.

Fishing gear can also be a source of whole body gamma exposure due to occupancy in the vicinity of the gear. However, this pathway is minor compared with the same exposure received during occupancy over intertidal areas and it has therefore been omitted from the report.

Table 18 shows the times spent handling fishing gear and intertidal sediment recorded during the survey.

The maximum fishing gear handling rate recorded was 1600 h/y for two commercial shore based stake net and set net fishermen. Three other commercial stake net fishermen had fishing gear handling rates that came within a factor of three of this. This gives a mean handling rate for this group of 1400 h/y.

The maximum sediment handling rate recorded was 780 h/y for a commercial bait digger. No other individuals had handling rates within a factor of three of this, so this is taken as the critical group handling rate.

4.10 Water based activities

Activities taking place in or on the water can lead to ingestion of water and/or inhalation of spray. These pathways are generally considered to be minor in comparison with other exposure pathways such as the ingestion of foods produced in the vicinity of a nuclear site. However, in order to enable dose assessment, relevant data have been collected. No manipulation of the data (for example, calculating critical group rates) has been carried out.

Occupancy rates for activities taking place in or on water in the survey area are shown in Table 19. For the purposes of this report, activities where there is a high likelihood of the individual's face going under water have been classified as activities in water, as they are more likely to lead to ingestion of water. All other activities have been classified as activities on water. The observations for occupancy on water include four children. Generic data for RNLI volunteers were gained through an interview with a RNLI representative.

Activities in the water

Jet skiing was the only activity regarded as taking place in the water around Hinkley Point. One observation was recorded with an occupancy rate of 10 h/y.

Activities on the water

Activities taking place on the water around Hinkley Point included houseboat dwelling, charter boat skippering, boat angling, sailing, boat maintenance, RNLI activities, push netting and canoeing. Forty-seven observations were recorded. The highest occupancy rate was 3100 h/y for an individual who was living on a houseboat; the time being that while the houseboat was afloat.

5 TERRESTRIAL RADIATION PATHWAYS

5.1 Terrestrial survey area

The terrestrial survey area covered all land and watercourses within 5 km of the site centre (NGR ST 211 460) as shown in Figure 2.

The land around the Hinkley Point site was predominantly agricultural. Within the survey area, the village of Stolford is located to the east of the site, the villages of Stockland Bristol, Otterhampton and Coultings are located to the south-east and the villages of Stogursey, Burton, Shurton and Knighton are located to the south-west.

Twenty-five farms were identified in the Hinkley Point survey area. Of these:

- Five produced beef cattle
- Seven produced beef cattle and dairy cattle
- One produced beef cattle, dairy cattle and pigs
- Five produced beef cattle and sheep
- Two produced dairy cattle
- One produced sheep
- One produced pigs
- Two produced chickens
- One produced pheasants and sheep
- Of these farms, 14 produced arable crops

Beef cattle and lambs were sold to Highbridge market; beef cattle were also sold to a wholesaler and butcher approximately 1 km outside the survey area, to Taunton market and to an abattoir at Langport. Milk was sold to a creamery at Nether Stowey, most of which was used to make cheese and a small amount of cream. The cheese was sold nationally and direct from the creamery. Two farms sold milk to the national chain Milk Link. Pigs were sold to an abattoir in Bristol. Chickens were sold to a processing plant in Devon. Some pheasants

were sold to shoots within the survey area, but most of the pheasants were sold to shoots outside the survey area. Fourteen farms produced arable crops, which included wheat, barley, beans, oil seed rape, maize, silage and linseed. The crops were kept for animal feed or sold to a grain merchant just outside the survey area. One farm also produced rhubarb, which was sold outside the survey area to the creamery, to farm shops and to restaurants.

Farmers and their families were consuming beef, lamb, pork and milk from their own farms.

One allotment site was located in the survey area, at Stogursey. The allotment site was well maintained; people were growing a range of fruit and vegetables as well as keeping chickens for eggs. Many private gardens with a large range of fruit and vegetables were noted and several people kept chickens in their gardens for eggs. Two private houses were identified that sold chicken eggs from the door; one of these also sold their own duck and goose eggs.

Three beekeepers were identified in the survey area with a combined total of 42 hives near the villages of Knighton, Coultings and Stringston. The average production of honey per hive per year was 27 kg. The beekeepers and their families consumed honey from their hives. Excess was given to friends or sold to from their door. Some was also sold to farm shops outside the survey area.

The consumption of wild foods included blackberries, sloes, mulberries, damsons, bullus plums, almonds, hazelnuts and mushrooms. Game from within the survey area was consumed; this included pheasant, pigeon, rabbit and venison. One private pheasant shoot was identified on farmland in the survey area.

Five households were using borehole water as their domestic supply, but no one was found drinking spring or well water. Livestock were identified drinking borehole water at seven farms and surface water at three farms; livestock were not found to be drinking well or spring water.

There was one freshwater trout fishery in the survey area, located to the south-west of the site. The trout lake was stocked once a week with rainbow trout, brown trout, blue trout and tiger trout; approximately 90% of trout caught was released back into the lake. Four individuals were consuming small amounts of rainbow trout and brown trout from the trout lake.

5.2 Unusual pathways

Transfer of radioactive contamination from the site into the surrounding area by wildlife was investigated. Representatives from Hinkley Point A and Hinkley Point B were asked about wildlife that could act as carriers for the transfer of radioactivity off site. Rabbits and pigeons were observed on both sites. However, neither were considered by the site operators to be a problem. A culling programme was in place for pigeons but not for rabbits. Members of the public who lived in the survey area were consuming pigeons and rabbits that were shot within the terrestrial survey area.

5.3 Wholesalers and retailers

Retailers and wholesalers located inside and outside the survey area were interviewed in order to find out whether they were selling produce from within the survey area; eight outlets in total were visited. They included: a creamery, (which also had a farm shop), four village shops, a baker, one butcher and one butcher/meat wholesaler. The following outlets were selling produce from within the terrestrial survey area. The creamery was using milk to make cheese and a small amount of cream. The cheese and cream was being sold nationally with a small amount sold from the creamery's farm shop, which also sold rhubarb. One butcher was selling beef, venison and honey. The butcher/meat wholesaler was selling beef and lamb. Two village shops were selling cheese from the creamery. One of these village shops also sold cream from the creamery as well as beef and lamb.

5.4 Food consumption data

Consumption data for locally produced foodstuffs potentially affected by gaseous discharges are presented in Tables 20 to 36 for adults and Tables 37 to 48 for children. These tables include the mean consumption rates of the critical groups together with the observed 97.5 percentile rates calculated as described in Section 3.2. For purposes of comparison, the data are summarised in Table 11 for adults and in Tables 12 to 14 for children (15 year olds, 10 year olds and 5 year olds respectively). No children in the 1 year old or 3 month old age groups were noted to be consuming locally produced foods potentially affected by gaseous discharges.

In order to provide information relevant to surveillance and assessments studies, the consumption rate data collected during the survey were analysed to indicate which food types most commonly contributed to each food group. The data are summarised in Table 49. Those food types shown in bold and labelled with an asterisk were sampled as part of the 2005 Food Standards Agency monitoring programme (EA, EHS, FSA and SEPA, 2006).

Adult consumption rates

Consumption of locally produced foods was identified in the following 17 food groups: green vegetables, other vegetables, root vegetables, potato, domestic fruit, milk, cattle meat, pig meat, sheep meat (excluding salt marsh grazed sheep), poultry, eggs, wild/free foods, rabbits/hares, honey, wild fungi, venison and freshwater fish. No consumption of local cereals was identified.

Critical group mean consumption rates were found to be greater than the generic 97.5 percentile consumption rates for green vegetables and other vegetables. A further nine critical group mean consumption rates exceeded the generic mean consumption rates. These were for root vegetables, potato, domestic fruit, milk, cattle meat, pig meat, sheep meat, eggs and honey. Five observed 97.5 percentile consumption rates exceeded the

generic 97.5 percentile consumption rates. These were for green vegetables, other vegetables, root vegetables, cattle meat and eggs.

Children's consumption rates

15 year old age group

Four children in this age group were identified to be eating locally produced food. Consumption was identified in the following 6 food groups: green vegetables, other vegetables, root vegetables, potato, domestic fruit and poultry. No consumption was identified for milk, cattle meat, pig meat, sheep meat, eggs, wild/free foods, rabbits/hares, honey, wild fungi, venison, freshwater fish and local cereals. Critical group mean consumption rates did not exceed the generic 97.5 percentile consumption rates for any food group. One critical group mean consumption rate exceeded the generic mean consumption rate. This was for root vegetables. No observed 97.5 percentile consumption rates were greater than the generic 97.5 percentile consumption rates.

10 year old age group

Eight children in this age group were identified as eating locally produced food. Consumption was identified in the following 12 food groups: green vegetables, other vegetables, root vegetables, potato, domestic fruit, milk, cattle meat, pig meat, poultry, eggs, wild/free foods and wild fungi. No consumption was identified for the following food groups: sheep meat, rabbits/hares, honey, venison, freshwater fish and local cereals. No critical group mean consumption rates exceed the generic 97.5 percentile consumption rates. In five food groups, the critical mean consumption rates were higher than the generic mean consumption rates, these were other vegetables, root vegetables, potato, pig meat and eggs. No observed 97.5 percentile consumption rates were greater than the generic 97.5 percentile consumption rates.

5 year old age group

Three children in this age group were identified as eating locally produced food. Consumption was identified in the following 10 food groups: green vegetables, other vegetables, potato, domestic fruit, milk, cattle meat, pig meat, eggs, wild/free foods and wild fungi. No consumption was identified for the following food groups: root vegetables, sheep meat, poultry, rabbits/hares, honey, venison, freshwater fish and local cereals. No generic 97.5 percentile or generic mean consumption rates have been determined for this age group so no comparisons with the corresponding observed rates are possible.

6 DIRECT RADIATION PATHWAYS

6.1 Direct radiation survey area

The direct radiation survey area is shown in Figure 2. It covered all land within 1 km of the Hinkley Point site perimeter fence, which delineates the external boundary of the Hinkley Point A and B licensed sites. The direct radiation survey also overlaps with direct exposure to gaseous releases from the site. Information on habits from the direct radiation survey also applies to gaseous releases from the site.

To the north, north-east and north-west of the site, the survey area is marine and includes the intertidal foreshore. A public coastal footpath ran parallel to the shore, past the north side of the site. Large sea defence boulders lined the upper foreshore and hindered access to the beach from the path; there was one set of steps to the beach in front of the site. At low tide there were exposed rocky reefs and large areas of mud and sand. The shore area, in particular the reefs, was reported to be popular with shore anglers, mainly in the winter months. Anglers and one beachcomber were noted on the beach at Hinkley Point, no one else was observed at the time of the survey. One farmer grazed beef cattle and sheep on the tide washed area to the north east of the site.

The area to the east of the site was farmland and moorland. It was sparsely populated with three residences located at the eastern edge of the survey area. Access to the area was limited to several footpaths; there were no roads in this part of the survey area. No one was observed dog walking or walking in this area.

To the south of the site was also farmland and moorland. One residential property was located near the southern edge of the survey area. There are several public footpaths in this area as well as the main road to the site. No one was observed dog walking or walking in this area.

To the west of the site the area was farmland. There were no residences. There was an access road to the beach along the west of the site; however, at the time of the survey this road was closed because of site activities. The only access to the west of the site at the time of the survey was by the coastal footpath. No one was seen picnicking, walking or dog walking in this area at the time of the survey.

6.2 Residential activities

The direct radiation survey area was sparsely populated with only four residences. All four residences were within the 0.5 – 1.0 km zone and interviews were conducted at all of them. Two of the residences had families with children.

6.3 Leisure activities

The only leisure activities that were observed in the direct radiation survey area were angling and beachcombing. It was reported that the rocky reefs were popular with shore anglers, mainly in the winter months and that bait digging occurred on the beach, although no one was seen. It was also reported that members of the public walked on the path by the sea wall close to the site.

The Hinkley Point Visitors Centre and the nature trail within the licensed site area have been closed for the last five years. The nature trail is due to re-open to the public in the summer of 2006.

6.4 Commercial activities

The only commercial activity within the direct radiation survey area was farming. Four farmers and their employees farmed the area to the east, south and west of the site. No commercial fishermen were fishing in the direct radiation survey area. The commercial

activities of the employees and contractors of the Hinkley Point site, while at work, were not included in the direct radiation survey.

6.5 Occupancy rates

Table 50 presents indoor, outdoor and total occupancy data for adults and children and includes distances from the site perimeter fence where these occupancies took place. An analysis of the data by distance zones and occupancy rates is shown in Table 51.

0 - 0.25 km from the site perimeter fence

Occupancy data were collected for 10 individuals in the 0.0 to 0.25 km zone. The observations were mainly farmers and their employees. A farmer working in the area had the highest total occupancy rate of 1500 h/y; this was all outdoors. There were no residences in the 0 – 0.25 km zone.

>0.25 – 0.5 km from the site perimeter fence

No one was identified spending time in the >0.25 to 0.5 km zone.

>0.5 – 1.0 km from the site perimeter fence

Occupancy data were collected for 16 people in the >0.5 to 1.0 km zone. The majority of observations were for residents. A resident had the highest total occupancy rate of 8400 h/y. The highest indoor rate was 8200 h/y for a resident. The highest outdoor rate was 3300 h/y for a different resident who also works from home.

6.6 Gamma dose rate measurements

Table 52 presents gamma dose rate measurements for the Hinkley Point direct radiation survey. Representative gamma dose rate measurements were taken at a height of 1 metre both inside and outside residences and at outdoor background locations outside the direct radiation survey area. Outdoor measurements were taken approximately 5 to 10 metres from the nearest buildings, and the background locations were in fields. It should be noted that the measurements have not been adjusted for natural background dose rates.

In the survey area, two outdoor measurements taken over grass were 0.071 and 0.073 μGy/h. Two indoor measurements over concrete were 0.061 and 0.065 μGy/h respectively at the corresponding locations. One measurement taken inside a caravan was 0.056 μGy/h.

Outside the survey area, background readings over grass ranged from 0.072 to 0.097 μGy/h. At the time of the survey, the outdoor measurements within the survey area were within the range of these background measurements.

Comprehensive studies of background radiation have been carried out on a national scale by the National Radiological Protection Board (since 1st April 2005 the Radiation Protection Division of the Health Protection Agency). The most recent of these being a review conducted in 2005 (Watson *et al*, 2005). The results from this review could be used for comparison.

7 COMBINED PATHWAYS

In determining habits data for the purposes of assessing radiological doses to the public, it may be necessary to consider a combination of pathways. Data are provided in Annexes 1 and 2 so that the full effect of combining pathways can be assessed for individual observations, given the concentrations and dose rates for a particular assessment. In some circumstances, it will be possible to make simplifying assumptions and define the consumption and external exposure rates appropriate to a series of potential critical groups. Such assumptions will depend on the assessment in question but some initial observations are provided here as a starting point for those undertaking assessments.

The most extensive combinations of pathways for adult dose assessment are shown in Table 53. Each of the 37 combinations shown in Table 53 represents an actual individual (or individuals) from Annex 1 who has positive data (irrespective of the magnitude), for each pathway marked with an asterisk. It should be noted that combination numbers in Table 53 do not correlate directly with observation numbers in Annex 1. Other individuals from Annex 1 have combinations that are not listed in Table 53 because they have fewer pathways and a dose assessment for them would be adequately covered by one of the 37 listed combinations.

Qualitative and estimated data shown in Annex 3 have not been included in Table 53. This is because data in Annex 3 are estimated rates for pathways that were heard about during the survey, but not quantified by interviewees.

Combinations of pathways at critical group rates may be achieved by considering the data in Annexes 1 and 2. Although critical group rates are not given in the annexes, the rates for individuals making up the groups are shown emboldened. Possible combinations of pathways and their associated critical group rates are therefore apparent.

7.1 Use of the data for assessing total dose

The Environment Agencies and the Food Standards Agency have considered ways of using habits data to calculate total dose retrospectively. The adopted approach is to use the adult consumption and occupancy data collected in each habits survey to create a matrix with a series of habits profiles for each site. The relevant matrix for the Hinkley Point adults' profiled habits data is shown in Annex 5. The National Dose Assessment Working Group (NDAWG) has considered this approach to assessing retrospective total doses (Camplin *et al*, 2005) and has agreed that using habits profiles is an appropriate approach. Retrospective total doses around Hinkley Point will in future be made using these profiles and reported in the Radioactivity in Food and the Environment Reports (See Appendix 7 in EA, EHS, FSA and SEPA, 2006). Data from Annex 3 are not included in Annex 5.

8 CONCLUSIONS AND SUGGESTIONS

8.1 Survey findings

The survey investigated the three potential sources of public radiation exposure from the Hinkley Point site, which were:

- Discharges of liquid radioactive waste to the Bristol Channel
- Discharges of gaseous radioactive waste to the atmosphere
- Emissions of direct radiation

Data were collected for 358 individuals including commercial fishermen, anglers, water sports enthusiasts, farmers, allotment holders and people spending time within 1 km of the site. These people were targeted because their habits and where they live may cause them to be exposed to radioactivity from the site. However, it should be noted that the most exposed people can only be defined with the outcome of a dose assessment.

All consumption rates recorded in this report are only for locally produced or caught foods.

The adult mean critical group rates (as defined in Section 3.2) for the separate local consumption pathways for foods potentially affected by liquid discharges were:

- 40 kg/y for fish
- 12 kg/y for crustaceans
- 1.9 kg/y for molluscs
- 6.4 kg/y for wildfowl
- 2.0 kg/y for marine plants/algae
- 20 kg/y for salt marsh grazed sheep

The predominant foods consumed by the respective critical groups for these food groups were thornback ray, cod, whiting, conger eel, bass, brown shrimps, whelks, mallard, teal, wigeon, *Porphyra umbilicalis*, sea lettuce, and salt marsh grazed lamb.

Two people were using seaweed as fertilizer on their vegetable gardens. No one was identified who used seaweed for animal feed, and no other unusual pathways were identified.

The mean critical group occupancy rates over the separate intertidal substrates were:

- 1300 h/y for mud
- 1200 h/y for mud and sand
- 130 h/y for mud, sand and stones
- 74 h/y for rock
- 380 h/y for salt marsh
- 540 h/y for sand
- 670 h/y for sand and stones
- 3700 h/y for living on a houseboat while over mud

The mean critical group rate for handling fishing gear was 1400 h/y and for handling sediment was 780 h/y.

The maximum occupancy rate in water was 10 h/y and the maximum occupancy rate for time spent on water was 3100 h/y.

The adult mean critical group rates for the separate local consumption pathways for foods potentially affected by gaseous discharges were:

- 45 kg/y for green vegetables
- 67 kg/y for other vegetables
- 34 kg/y for root vegetables
- 59 kg/y for potato
- 44 kg/y for domestic fruit
- 140 l/y for milk
- 39 kg/y for cattle meat
- 19 kg/y for pig meat
- 8.1 kg/y for sheep meat (excluding salt marsh grazed sheep)

- 8.5 kg/y for poultry
- 18 kg/y for eggs
- 4.2 kg/y for wild/free foods
- 1.4 kg/y for rabbits/hares
- 3.8 kg/y for honey
- 1.7 kg/y for wild fungi
- 10 kg/y for venison
- 1.2 kg/y for freshwater fish

No consumption of local cereals was identified. Consumption of foodstuffs by children was also recorded. Combinations of food groups (both aquatic and terrestrial) consumed at critical group rates, together with external pathway exposures, may be derived from the data for individuals in Annexes 1 and 2. Rates for individuals making up the critical groups are presented in bold type.

The consumption of borehole water was identified at five households. This was being used as their domestic supply. No evidence of the consumption of surface water, well water or spring water was found. Livestock were drinking borehole and surface water.

Transfer of radioactive contamination from the site into the surrounding area by wildlife was investigated. Rabbits and pigeons were observed on both sites; neither was considered by the site operators to be a problem. A culling programme was in place for pigeons but not for rabbits. Members of the public who lived in the survey area were consuming pigeons and rabbits that were shot within the terrestrial survey area.

For occupancy by members of the public within 1 km of the Hinkley Point site perimeter fence, the highest rates were:

- 1500 h/y for the 0 to 0.25 km zone, all spent outdoors
- No one was identified spending time in the >0.25 to 0.5 km zone

- 8400 h/y for the >0.5 to 1.0 km zone, indoors plus outdoors; 8200 h/y indoors; 3300 h/y outdoors

In the 0 to 0.25 km zone, the highest occupancy rate was for a farmer who spent the entire time outdoors. In the >0.5 to 1.0 km zone, one resident had the highest total and highest indoor occupancy rates; another resident who worked from home had the highest outdoor occupancy rate.

8.2 Comparisons with previous surveys

The results from this 2006 survey can be compared with results from the last aquatic and terrestrial habits surveys, which were both undertaken in 2000. The survey areas used in the 2006 survey were the same as those used in 2000. The results from the 2006 survey cannot be directly compared with the last direct radiation survey undertaken in 1995 because a different survey area was used. The 1995 survey area was identified as 1 km from the Hinkley Point A power station perimeter fence; in 2006, the survey area was 1 km from the Hinkley Point site perimeter fence, which delineates the external boundary of the Hinkley Point A and B licensed sites.

All comparisons for internal exposure pathways include data for adults only. Comparisons for external exposure pathways include data for both adults and children.

Aquatic survey

In 2000, the critical group mean consumption rate for fish was 43 kg/y for a group of 11 people, and the maximum consumption rate was 83 kg/y. The main species of fish consumed by the critical group were cod and dab. In 2006, the critical group consumption rate decreased slightly to 40 kg/y, the maximum consumption rate decreased to 69 kg/y, and the number in the critical group increased to 15. The main species consumed by this critical group were thornback ray and cod.

In 2000, the critical group mean consumption rate for crustaceans was 9.8 kg/y, the maximum consumption rate was 12 kg/y and the number of people in the critical group was seven. The main species of crustaceans consumed by the critical group were shrimp and common prawn. In 2006, the critical group consumption rate increased slightly to 12 kg/y, the maximum consumption rate also increased slightly to 15 kg/y and the number in the critical group decreased to three. The only species of crustaceans consumed by this critical group was brown shrimp.

In 2000, the critical group mean consumption rate and maximum consumption rate for molluscs was 1.8 kg/y and the number of people in the critical group was one. In 2006, the critical group consumption rate and the maximum consumption rate were similar at 1.9 kg/y, and the critical group, composed two people. The main species consumed in 2000 and 2006 was whelks.

A comparison of wildfowl consumption rates cannot be made because in the 2000 survey consumption rates for wildfowl were not obtained.

In 2000, the critical group mean consumption rate and the maximum consumption rate for marine plants and algae was 2.3 kg/y, and the number of people in the critical group was two. In 2006, the critical group consumption rate was similar at 2.0 kg/y, the maximum consumption rate was also similar at 2.2 kg/y and the critical group was also two. The main species consumed in 2000 was an unspecified type of intertidal green algae, and in 2006 it was *Porphyra umbilicalis*.

A comparison of salt marsh grazed lamb consumption rates cannot be made because in the 2000 survey this pathway was not identified.

For intertidal occupancy, two substrates, mud and sand were recorded in 2000. In 2006, seven substrates were identified including mud and sand. These two can be compared.

For external pathways, it should be noted that the methodology for determining the critical group has changed since the 2000 survey (see Section 3.2) so care is needed when comparing results. In the following paragraphs, the critical group rates from the 2000 survey have been recalculated using the current method and the rates in brackets were calculated using the original method.

The 2000 critical group mean intertidal occupancy rate over mud was 960 h/y for two commercial stake net fishermen, the maximum being 1100 h/y (the mean rate and number of individuals were the same using the 2000 methodology). The 2006 critical group mean intertidal occupancy rate over mud had increased to 1300 h/y for three commercial stake net fishermen, two of whom also used set nets. The maximum rate at 1600 h/y had also increased.

The 2000 critical group mean intertidal occupancy rate over sand using the current methodology was 760 h/y for three beach wardens, four anglers, three people operating donkey rides and nine dog walkers (890 h/y for three beach wardens, two anglers, three people operating donkey rides and four dog walkers), the maximum rate being 1200 h/y. The 2006 critical group mean intertidal occupancy rate over sand was lower at 540 h/y for one person renting deckchairs, nine beach wardens and two dog walkers. The maximum rate at 840 h/y was also lower.

A comparison of intertidal occupancy rates for living on a houseboat cannot be made because this pathway was not identified in the 2000 survey.

The 2000 critical group mean handling rate for commercial fishing gear was 1000 h/y for two commercial stake net fishermen, the maximum handling rate being 1000 h/y (this was the same using the 2000 methodology). The 2006 critical group mean handling rate for commercial fishing gear was higher at 1400 h/y for five commercial stake net fishermen three of whom also handled set nets. The maximum rate at 1600 h/y had also increased.

The 2000 critical group mean handling rate for sediment using the 2006 methodology was 100 h/y for seven bait diggers (150 h/y for two bait diggers), the maximum handling rate being 160 h/y. The 2006 critical group mean handling rate for sediment was considerably higher at 780 h/y for one commercial bait digger.

A comparison of occupancy rates in and on water cannot be made because this pathway was not investigated in the 2000 survey.

Terrestrial survey

For terrestrial food groups the data in the 2000 survey were not used to calculate critical group rates. Therefore, for the purpose of comparison these rates have been calculated from the original data. The critical group mean consumption rates (kg/y and l/y) in the 2000 survey are tabulated below, together with those of the 2006 survey:

	2000	2006
• Green vegetables	56	45
• Other vegetables	58	67
• Root vegetables	33	34
• Potato	65	59
• Domestic fruit	97	44
• Milk	250	140
• Cattle meat	49	39
• Pig meat	33	19
• Sheep meat	55	8.1
• Poultry	*	8.5
• Eggs	82	18
• Wild/free foods	37	4.2
• Rabbits/hares	15	1.4
• Honey	4.5	3.8

• Wild fungi	20	1.7
• Venison	1.7	10
• Freshwater fish	**	1.2

* The critical group mean consumption rate for poultry in the 2000 terrestrial survey was 52 kg/y. A comparison of poultry consumption rates cannot be made because wildfowl was included in the poultry group in the 2000 survey, whereas in 2006 it formed a separate food group (see Section 4.5). It has not been possible to differentiate between poultry and wildfowl in the 2000 data.

** The 2000 data included marine and freshwater fish and it has not been possible to separate the data.

Consumption rates had increased in 2006 in the two food groups: other vegetables and venison. Consumption rates had decreased in 2006 in the remaining 13 food groups: green vegetables, root vegetables, potato, domestic fruit, milk, cattle meat, pig meat, sheep meat, eggs, wild/free foods, rabbits/hares, honey and wild fungi. There were large reductions in domestic fruit, milk, sheep meat, eggs, wild/free foods, rabbits/hares and wild fungi.

Direct radiation survey

A larger direct radiation survey area was covered in 2006 than in 1995; in 2006 it covered 1 km from Hinkley Point A and B site perimeter fence, in 1995 1 km from the Hinkley Point A site perimeter fence. However some comparisons can be provided, it is noted that activities may have been carried out in different areas.

One outdoor commercial activity noted in the 1995 direct radiation survey area and still being carried out in 2006 was farming. In 1995 the highest occupancy rate for a farmer was 750 h/y and in 2006 the highest occupancy rate was 1500 h/y. The commercial fisherman who was fishing in the area in 1995 has since retired. Angling was the only leisure activity to be identified in both surveys. In 1995 the highest occupancy rate was 1200 h/y and in 2006 the highest rate was 28 h/y. It should be noted that the 1995 survey was conducted in January

when the area was very popular with anglers; the 2006 survey was conducted in May which was not popular with anglers. All of the rates for these activities were for outdoors.

A comparison of residential occupancy rates cannot be made because no one was found to be residing in the 1995 survey area. Similarly, gamma dose rate measurements at residences cannot be compared because none were taken in 1995.

8.3 Suggestions for environmental monitoring

The 2005 monitoring programmes operated by the Environment Agency and the Food Standards Agency included the following samples and measurements (EA, EHS, FSA and SEPA, 2006):

Aquatic surveillance

- Cod from Stolford
- Shrimps from Stolford
- Whelks from Stolford
- Seaweed from the pipeline
- Sediment from the pipeline, 1.6 km east and 0.8 km west of the pipeline, Stolford, Stert Flats and River Parrett
- Seawater from the pipeline

Gamma dose rate measurements

- Mud and rock at Watchet Harbour
- Mud and sand at River Parrett and Stert Flats
- Pebbles at Blue Anchor Bay
- Pebbles and sand at Hinkley Point
- Pebbles and stones at Kilve and Watchet Harbour
- Rock and sand at Stolford
- Rock and slate at Kilve

- Sand at Weston-Super-Mare, Burnham, Stert Flats
- Shingle and rock at Hinkley Point
- Sand and shingle at Blue Anchor Bay
- Stones at Stolford

Terrestrial surveillance

- Apples
- Blackberries
- Cabbage
- Milk
- Onions
- Potatoes
- Rhubarb
- Runner beans
- Wheat
- Freshwater from Durleigh Reservoir and Ashford Reservoir

The following lists are suggestions for changes to the current environmental monitoring programmes. It should be noted that the suggestions are based on the findings of this survey. They are not the outcome of any form of assessment. It is suggested that samples currently monitored, which are not listed below, remain unchanged in the monitoring programme.

Environment Agency monitoring

- Gamma dose rate measurements could be introduced over mud at Stolford and over mud and sand at Blue Anchor. At both locations commercial shore based fishermen have high occupancy rates.
- Gamma dose rate measurements could be introduced at Watchet Harbour because of the houseboat occupancy.

- A sediment sample could also be introduced at Burnham-on-Sea and Berrow because a commercial bait digger has high handling rates here.

Food Standards Agency monitoring

- A sample of thornback ray from Stolford could be introduced as this was being caught by hobby fishermen and was consumed in high amounts.
- A sample of *Porphyra* from Stolford could be introduced as this was being consumed.
- A sample of soil and vegetables could be introduced from the private vegetable garden in Stolford on which seaweed was being used as a fertiliser.
- A sample of salt marsh grazed lamb could be introduced because this was being consumed.
- A sample of rabbit and pigeon could be introduced as they were being consumed from the terrestrial survey area and could be potential carriers for off-site transfer of radioactive materials.

9 ACKNOWLEDGEMENTS

Gratitude is expressed to representatives of local authorities and associations and members of the public who offered helpful advice and information during the survey. This survey was undertaken on behalf of the Environment Agency, the Food Standards Agency and the Health and Safety Executive. The project officers for these organisations gave considerable help during the planning of the survey and the drafting of the report.

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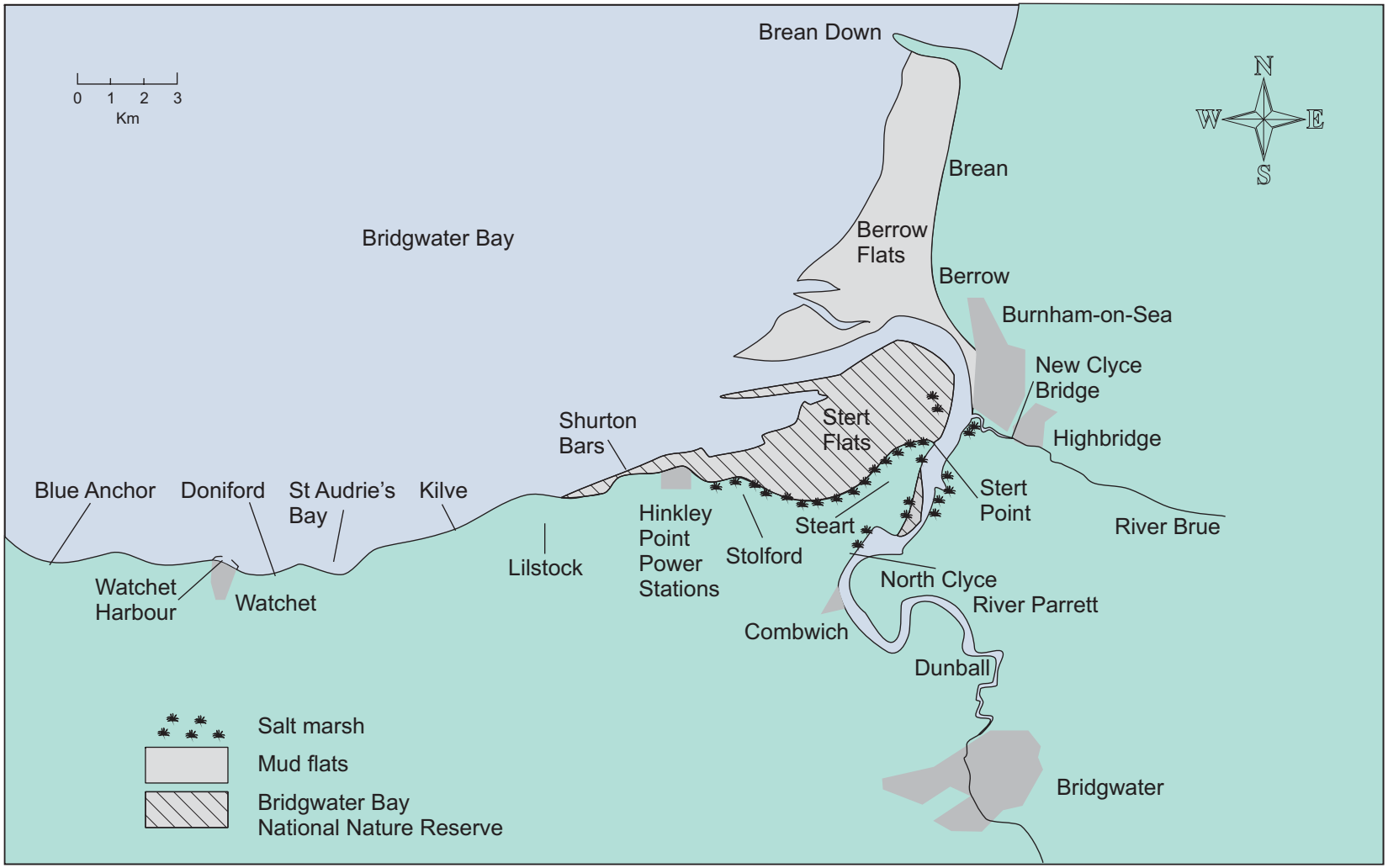

Figure 1. The Hinkley Point aquatic survey area

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Figure 2. The Hinkley Point terrestrial (outer ring) and direct radiation (inner ring) survey areas

- The Hinkley Point site centre
- Stogursey Allotments

Table 1. Survey coverage

Group	Criteria	Estimate of complete coverage	Number for whom positive data were obtained	Coverage for positive observations	Notes
SUMMARY OF ALL PATHWAYS					
All potential people in Hinkley Point aquatic, terrestrial and direct radiation survey areas	Number of people resident in terrestrial survey area (excluding those resident in the direct radiation survey area) (See (B) terrestrial pathways)	1900[a]	147[b]	8%	The survey targeted individuals who were potentially the most exposed (See Section 2.4), mostly producers of local food (farmers and allotment holders). The number for whom positive data were obtained includes 26 people who only consumed terrestrial foods but lived outside 5 km, and 2 people who live in the terrestrial survey area but are affected by liquid discharge.
	Number of people resident in the direct radiation survey area (See (C) direct radiation pathways)	10	10	100%	
	Number of people employed but not resident in the direct radiation survey area (See (C) direct radiation pathways)	10	3	30%	Excluding 5 people that live in the terrestrial area but work in the direct radiation area. Excluding employees and contractors of Magnox Electric Ltd. and British Energy Generation Ltd., and people living in the direct radiation survey area
	Number of people visiting residents (See (C) direct radiation pathways)	U	2	U	
	Number of people affected by liquid discharges (excluding people resident in the terrestrial survey area) (See (A) aquatic pathways)	U	196[b]	U	
	Total for aquatic, terrestrial and direct radiation survey areas	U	358[b]	U	In the Summary of All Pathways section each interviewee has only been counted once. This is in the section where their predominant activities took place
(A) AQUATIC PATHWAYS					
Commercial fishermen	Number of commercial fishermen actively fishing in survey area	5	5	100%	Excludes 2 licensed fishermen who were not fishing at the time of the survey
Charter boat skippers	Number seen or heard of during survey	10	2	20%	Estimate of complete coverage includes 8 charter boat skippers based outside the survey area that may spend time in the survey area
Boat anglers and hobby fishermen	Number seen or heard of during survey	U	9	U	
Shore anglers and other beach users	Number seen in action or spoken to during survey	U	141	U	
Watersports enthusiasts, sailors and RNLI volunteers	Members of clubs in survey area and people seen in action or spoken to during survey period	U	33	U	Interview with an RNLI representative provided generic data for 15 people
Houseboats	Number of people living on houseboats in the area	10	4	40%	Estimate of 6 occupied houseboats, occupants of 3 houseboats were interviewed
Wildfowlers	Number seen or heard of during survey	50	1	2%	

Table 1. Survey coverage

Group	Criteria	Estimate of complete coverage	Number for whom positive data were obtained	Coverage for positive observations	Notes
(B) TERRESTRIAL PATHWAYS[c]					
Farms	Number of farmers and their family members consuming food from the survey area	85	81	95%	Estimate of 26 working farms in the area, of which 25 farmers were interviewed
Allotments	Number of allotment holder and their family members consuming food from the survey area	40	16	40%	One allotment site in the area, 4 allotment holders were interviewed
Bee keepers	Number of people consuming honey in survey area	U	17	U	Estimate of 3 beekeepers in the area, all of which were interviewed
(C) DIRECT RADIATION PATHWAYS					
Occupancy of area	Number with occupancies > 100 hours (excluding site employees)	U	18	U	
Residences	Number of residents in the survey area	10	10	100%	Estimate of 4 occupied houses in the area, 4 households were interviewed
Employees	Number of people employed in the survey area >100 hours	10	6	60%	Excluding 2 people who are employed in the direct radiation area < 100 hours
People visiting residents	Number of people visiting residents (>100 hours)	U	2	U	
BREAKDOWN OF AGE GROUPS					
Adults	Individuals over 17	U	312	U	
15 year old	More than 12.0 year old to 17.0 year old	U	14	U	
10 year old	More than 7.0 year old to 12.0 year old	U	19	U	
5 year old	More than 2.0 year old to 7.0 year old	U	11	U	
1 year old	More than 1.0 year old to 2.0 year old	U	2	U	
3 months old	From 0 to 1.0 year old	U	0	U	

Notes

[a] Data from www.statistics.gov.uk were used to estimate this figure for people resident in the 5 km survey area.

[b] The number of people for whom positive data was obtained, for pathways (A) and (B), will not equal the relevant totals in the summary of all pathways. This is because some individuals, for example someone who fishes from a boat and the shore and digs their own bait, will be counted three times within the pathway, whereas others, such as the families of fishermen, will not be counted at all.

[c] 8 shops were visited during the survey.

U - Unknown

Table 2. Typical food groups used in habits surveys

Green vegetables	Globe artichoke, asparagus, broccoli, brussel sprout, cabbage, calabrese, cauliflower, chard, courgettes, cucumber, gherkin, herbs, kale, leaf beet, lettuce, marrow, spinach
Other vegetables	Aubergine, broad bean, chilli pepper, french bean, mangetout, pea, pepper, runner bean, sweetcorn, tomato
Root vegetables	Jerusalem artichoke, beetroot, carrot, celeriac, celery, chicory, fennel, garlic, kohl rabi, leek, onion, parsnip, radish, shallot, spring onion, swede, turnip
Potato	
Domestic fruit	Apple, apricot, blackberry, blackcurrant, boysenberry, cherry, damson, fig, gooseberry, grapes, greengages, huckleberry, loganberry, melon, nectarines, peach, pear, plum, pumpkin, raspberry, redcurrants, rhubarb, rowanberry, strawberry, tayberry, whitecurrant
Milk	Milk, butter, cream, cheese, yoghurt, goats milk
Cattle meat †	
Pig meat †	
Sheep meat †	
Poultry	Chicken, duck, goose, grouse, guinea fowl, partridge, pheasant, pigeon, snipe, turkey, woodcock
Eggs	Chicken egg, duck egg, goose egg
Wild/free foods	Blackberry, blackcurrant, chestnut, crab apple, damson, dandelion root, elderberry, nettle, raspberry, rowanberry, samphire, sloe, strawberry, watercress, wild apple
Honey	
Wild Fungi	Mushrooms
Rabbits/Hare	Hare, rabbit
Venison †	
Fish (sea)	Bass, brill, cod, common ling, dab, Dover sole, flounder, gurnard, haddock, hake, herring, lemon sole, mackerel, monkfish, mullet, plaice, pollack, witch saithe, salmon, sea trout, squid*, cuttlefish*, rays, turbot, whitebait, whiting
Fish (freshwater)	Brown trout, rainbow trout, perch, pike, salmon (river), eels
Crustaceans	Brown crab, spider crab, crawfish, lobster, *Nephrops*, squat lobster, prawn, shrimp
Molluscs	Cockles, limpets, mussels, oysters, queens, scallops, razor shell, whelks, winkles

Notes:
* Although squid and cuttlefish are molluscs, radiologically they are more akin to fish
† Including offal

Table 3. Adults' consumption rates of fish in the Hinkley Point area (kg/y)

Observation number	Bass	Cod	Dover sole	Conger eel	Eel	Flounder	Grey mullet	Herring	Lesser spotted dogfish	Mackerel	Mixed fish	Monkfish	Plaice	Pollack	Sprat	Spurdog	Thornback ray	Turbot	Whiting	Total
182		**48.3**																		**68.9**
180		**29.5**															**29.5**			**59.0**
123											**44.2**									**44.2**
124											**44.2**									**44.2**
125											**44.2**									**44.2**
170																	**41.9**			**41.9**
171																	**41.9**			**41.9**
286	**1.3**	**6.0**	**2.5**	**9.0**	**0.9**	**1.2**			**1.6**								**7.9**		**9.7**	**40.1**
287	**1.3**	**6.0**	**2.5**	**9.0**	**0.9**	**1.2**			**1.6**								**7.9**		**9.7**	**40.1**
301	**6.4**	**18.0**												**11.2**					**3.9**	**39.5**
181		**17.7**															**17.7**			**35.4**
275		**23.8**																		**23.8**
186	**5.9**	**5.9**														**5.9**	**5.9**			**23.6**
195																	**23.6**			**23.6**
196																	**23.6**			**23.6**
46	2.4	3.3		5.3		0.9							0.9				2.0	1.2	1.7	17.6
172-177																	14.0			14.0
126-127											11.8									11.8
131-140											11.8									11.8
202-203		5.0															5.0			10.0
188-189		4.1								4.1										8.2
183-184		3.4					3.4													6.8
99-98	0.5	2.2																	2.6	5.4
290		5.3																		5.3
310-311		2.6															2.6			5.3
193-194								3.6												3.6
185		1.7					1.7													3.4
298-300	0.4	2.2							0.5										0.3	3.4

Table 3. Adults' consumption rates of fish in the Hinkley Point area (kg/y)

Observation number	Bass	Cod	Dover sole	Conger eel	Eel	Flounder	Grey mullet	Herring	Lesser spotted dogfish	Mackerel	Mixed fish	Monkfish	Plaice	Pollack	Sprat	Spurdog	Thornback ray	Turbot	Whiting	Total
144-145											2.7									2.7
147-148											2.7									2.7
162-163											2.7									2.7
226-228		1.8					0.7								0.2					2.6
103																	2.5			2.5
296-297		1.1		0.5													0.5		0.5	2.5
74-75						1.0													1.3	2.3
45							1.4												0.9	2.3
277		0.9										0.9								1.8
279-280																			1.4	1.4
158-159	1.3																			1.3
199-200		0.4																	0.1	0.5

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of fish based on the 15 highest adult consumers is 39.6 kg/y

The observed 97.5 percentile rate based on 73 observations is 47.2 kg/y

Table 4. Adults' consumption rates of crustaceans in the Hinkley Point area (kg/y)

Observation number	Brown shrimp	Common prawn	Total
125	**15.3**		**15.3**
123	**15.3**		**15.3**
124	**6.1**		**6.1**
195		1.6	1.6
196		1.6	1.6
126	1.5		1.5
127	1.5		1.5
131	1.5		1.5
132	1.5		1.5
133	1.5		1.5
134	1.5		1.5
135	1.5		1.5
136	1.5		1.5
137	1.5		1.5
138	1.5		1.5
139	1.5		1.5
140	1.5		1.5
279	0.5		0.5
280	0.5		0.5
226	0.3		0.3
227	0.3		0.3
228	0.3		0.3
277	0.2		0.2

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of crustaceans based on the 3 highest adult consumers is 12.2 kg/y

The observed 97.5 percentile rate based on 23 observations is 15.3 kg/y

Table 5. Adults' consumption rates of molluscs in the Hinkley Point area (kg/y)

Observation number	Whelk
123	**1.9**
125	**1.9**

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of molluscs based on the 2 highest adult consumers is 1.9 kg/y

The observed 97.5 percentile rate based on 2 observations is 1.9 kg/y

Table 6. Adults' consumption rates of wildfowl in the Hinkley Point area (kg/y)

Observation number	Mallard	Teal	Wigeon	Total
114	**4.1**	**3.2**	**2.4**	**9.7**
115	**1.4**	**1.1**	**0.8**	**3.2**
238	0.3	0.02	0.1	0.3
239	0.3	0.02	0.1	0.3
240	0.3	0.02	0.1	0.3
241	0.3	0.02	0.1	0.3
242	0.3	0.02	0.1	0.3
243	0.3	0.02	0.1	0.3
244	0.3	0.02	0.1	0.3

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of wildfowl based on the 2 highest adult consumers is 6.4 kg/y
The observed 97.5 percentile rate based on 9 observations is 8.4 kg/y

Table 7. Adults' consumption rates of marine plants/algae in the Hinkley Point area (kg/y)

Observation number	*Porphyra umbilicalis*	Sea lettuce	Total
123	**1.8**	**0.5**	**2.2**
125	**1.8**		**1.8**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of marine plants and algae based on the 2 highest adult consumers is 2.0 kg/y
The observed 97.5 percentile rate based on 2 observations is 2.2 kg/y

Table 8. Adults' consumption rates of salt marsh grazed sheep in the Hinkley Point area (kg/y)

Observation number	Lamb
142	**20.0**
143	**20.0**
238	3.8
239	3.8
240	3.8
234	2.8
235	2.8
236	2.8
237	2.8

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of salt marsh grazed sheep based on the 2 highest adult consumers is 20 kg/y
The observed 97.5 percentile rate based on 9 observations is 20 kg/y

Table 9. Children's consumption rates of fish in the Hinkley Point area (kg/y)

15 year old age group

Observation number	Age	Bass	Cod	Mixed fish	Spurdog	Thornback ray	Whiting	Total
187	**15**	**5.9**	**5.9**		**5.9**	**5.9**		**23.6**
130	**12**			**11.8**				**11.8**
201	14		0.4				0.1	0.5

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of fish based on the 2 highest 15 year old age group consumers is 17.7 kg/y
The observed 97.5 percentile rate based on 3 observations is 23.0 kg/y

10 year old age group

Observation number	Age	Bass	Cod	Mixed fish	Spurdog	Thornback ray	Whiting	Total
129	**11**			**11.8**				**11.8**
128	**10**			**11.8**				**11.8**
204	**9**		**5.0**			**5.0**		**10.0**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of fish based on the 3 highest 10 year old age group consumers is 11.2 kg/y
The observed 97.5 percentile rate based on 3 observations is 11.8 kg/y

5 year old age group

Observation number	Age	Bass	Cod	Mixed fish	Spurdog	Thornback ray	Whiting	Total
312	**4**		**1.3**			**1.3**		**2.6**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of fish based on the only 5 year old age group consumer is 2.6 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

1 year old age group

Observation number	Age	Bass	Cod	Mixed fish	Spurdog	Thornback ray	Whiting	Total
313	**1**		**1.3**			**1.3**		**2.6**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of fish based on the only 1 year old age group consumer is 2.6 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

Table 10. Children's consumption rates of crustaceans in the Hinkley Point area (kg/y)

15 year old age group

Observation number	Age	Brown shrimp	Common prawn	Total
197	**16**		**1.6**	**1.6**
198	**15**		**1.6**	**1.6**
130	**12**	**1.5**		**1.5**

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of crustaceans based on the 3 highest 15 year old age group consumers is 1.6 kg/y

The observed 97.5 percentile rate based on 3 observations is 1.6 kg/y

10 year old age group

Observation number	Age	Brown shrimp	Common prawn	Total
129	**11**	**1.5**		**1.5**
128	**10**	**1.5**		**1.5**

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of crustaceans based on the 2 highest 10 year old age group consumers is 1.5 kg/y

The observed 97.5 percentile rate based on 2 observations is 1.5 kg/y

Table 11. Summary of adults' consumption rates in the Hinkley Point area (kg/y or l/y)

Food group	Number of observations	No. higher rate consumers	Observed maximum critical group consumption rate	Observed minimum critical group consumption rate	Observed mean critical group consumption rate	Observed 97.5 %ile consumption rate	Generic mean consumption rate	Generic 97.5 %ile consumption rate
Fish	73	15	68.9	23.6	39.6	47.2	15.0	40.0
Crustaceans	23	3	15.3	6.1	12.2	15.3	3.5	10.0
Molluscs	2	2	1.9	1.9	1.9	1.9	3.5	10.0
Wildfowl	9	2	9.7	3.2	6.4	8.4	ND	ND
Marine plants/algae	2	2	2.2	1.8	2.0	2.2	ND	ND
Salt marsh grazed sheep	9	2	20.0	20.0	20.0	20.0	8[a]	25[a]
Green vegetables	67	12	80.6	29.8	45.2	61.7	15.0	45.0
Other vegetables	70	9	92.2	30.8	67.1	90.3	20.0	50.0
Root vegetables	65	16	63.1	21.5	34.4	59.0	10.0	40.0
Potato	70	35	100.0	34.1	58.5	100.0	50.0	120.0
Domestic fruit	64	22	72.5	28.6	43.6	64.8	20.0	75.0
Milk	27	23	207.4	87.5	137.5	207.4	95.0	240.0
Cattle meat	47	23	60.0	23.6	38.8	58.1	15.0	45.0
Pig meat	19	19	27.5	14.5	19.0	27.5	15.0	40.0
Sheep meat	25	23	15.1	5.7	8.1	15.1	8.0	25.0
Poultry	37	8	14.4	5.4	8.5	14.4	10.0	30.0
Eggs	41	17	35.3	11.9	18.5	35.3	8.5	25.0
Wild/free foods	51	20	6.7	2.9	4.2	6.7	7.0	25.0
Rabbits/hares	17	8	2.5	0.9	1.4	2.5	6.0	15.0
Honey	17	9	5.9	2.7	3.8	5.9	2.5	9.5
Wild fungi	21	7	2.3	0.9	1.7	2.3	3.0	10.0
Venison	5	2	10.0	10.0	10.0	10.0	ND	ND
Freshwater fish	4	4	1.2	1.2	1.2	1.2	15.0	40.0

Notes

ND = not determined

NC = not consumed

NA = not applicable

[a] The generic rates shown are applicable to sheep meat, not specifically salt marsh grazed sheep

Table 12. Summary of 15 year old children's consumption rates in the Hinkley Point area (kg/y or l/y

Food group	Number of observations	No. higher rate consumers	Observed maximum critical group consumption rate	Observed minimum critical group consumption rate	Observed mean critical group consumption rate	Observed 97.5 %ile consumption rate	Generic mean consumption rate	Generic 97.5 %ile consumption rate
Fish	3	2	23.6	11.8	17.7	23.0	6.5	20.0
Crustaceans	3	3	1.6	1.5	1.6	1.6	2.5	6.0
Molluscs	NC	NC	NC	NC	NC	NC	2.5	6.0
Wildfowl	NC	NC	NC	NC	NC	NC	ND	ND
Marine plants/algae	NC	NC	NC	NC	NC	NC	ND	ND
Salt marsh grazed sheep	NC	NC	NC	NC	NC	NC	5.5[a]	15[a]
Green vegetables	3	3	2.0	1.4	1.6	2.0	9.0	25.0
Other vegetables	3	3	5.9	3.7	5.1	5.9	10.0	30.0
Root vegetables	3	2	18.7	18.7	18.7	18.7	7.5	20.0
Potato	3	2	20.5	20.5	20.5	20.5	60.0	130.0
Domestic fruit	1	1	0.3	0.3	0.3	NA	15.0	50.0
Milk	NC	NC	NC	NC	NC	NC	110.0	260.0
Cattle meat	NC	NC	NC	NC	NC	NC	15.0	35.0
Pig meat	NC	NC	NC	NC	NC	NC	10.0	30.0
Sheep meat	NC	NC	NC	NC	NC	NC	5.5	15.0
Poultry	1	1	1.1	1.1	1.1	NA	6.5	20.0
Eggs	NC	NC	NC	NC	NC	NC	7.0	25.0
Wild/free foods	NC	NC	NC	NC	NC	NC	3.0	13.0
Rabbits/hares	NC	NC	NC	NC	NC	NC	ND	ND
Honey	NC	NC	NC	NC	NC	NC	2.0	5.0
Wild fungi	NC	NC	NC	NC	NC	NC	2.0	5.5
Venison	NC	NC	NC	NC	NC	NC	ND	ND
Freshwater fish	NC	NC	NC	NC	NC	NC	6.5	20.0

Notes

ND = not determined

NC = not consumed

NA = not applicable

[a] The generic rates shown are applicable to sheep meat, not specifically salt marsh grazed sheep

For 1 observation, the terms maximum, minimum and mean are not strictly valid

Table 13. Summary of 10 year old children's consumption rates in the Hinkley Point area (kg/y or l/y

Food group	Number of observations	No. higher rate consumers	Observed maximum critical group consumption rate	Observed minimum critical group consumption rate	Observed mean critical group consumption rate	Observed 97.5 %ile consumption rate	Generic mean consumption rate	Generic 97.5 %ile consumption rate
Fish	3	3	11.8	10.0	11.2	11.8	6.0	20.0
Crustaceans	2	2	1.5	1.5	1.5	1.5	2.5	7.0
Molluscs	NC	NC	NC	NC	NC	NC	2.5	7.0
Wildfowl	NC	NC	NC	NC	NC	NC	ND	ND
Marine plants/algae	NC	NC	NC	NC	NC	NC	ND	ND
Salt marsh grazed sheep	NC	NC	NC	NC	NC	NC	4[a]	10[a]
Green vegetables	5	3	6.0	4.5	5.5	6.0	6.0	20.0
Other vegetables	5	5	22.2	16.3	19.4	22.2	8.0	25.0
Root vegetables	3	3	18.8	7.2	11.0	18.2	6.0	20.0
Potato	6	2	62.5	34.1	48.3	59.0	45.0	85.0
Domestic fruit	5	3	12.1	9.3	10.2	11.8	15.0	50.0
Milk	1	1	87.5	87.5	87.5	NA	110.0	240.0
Cattle meat	1	1	14.3	14.3	14.3	NA	15.0	30.0
Pig meat	1	1	8.6	8.6	8.6	NA	8.5	25.0
Sheep meat	NC	NC	NC	NC	NC	NC	4.0	10.0
Poultry	2	2	1.1	1.1	1.1	1.1	5.5	15.0
Eggs	2	2	11.1	11.1	11.1	11.1	6.5	20.0
Wild/free foods	6	5	1.4	0.6	0.9	1.4	3.0	11.0
Rabbits/hares	NC	NC	NC	NC	NC	NC	ND	ND
Honey	NC	NC	NC	NC	NC	NC	2.0	7.5
Wild fungi	1	1	0.2	0.2	0.2	NA	1.5	4.5
Venison	NC	NC	NC	NC	NC	NC	ND	ND
Freshwater fish	NC	NC	NC	NC	NC	NC	6.0	20.0

Notes

ND = not determined

NC = not consumed

NA = not applicable

[a] The generic rates shown are applicable to sheep meat, not specifically salt marsh grazed sheep

For 1 observation, the terms maximum, minimum and mean are not strictly valid

Table 14. Summary of 5 year old children's consumption rates in the Hinkley Point area (kg/y or l/y

Food group	Number of observations	No. higher rate consumers	Observed maximum critical group consumption rate	Observed minimum critical group consumption rate	Observed mean critical group consumption rate	Observed 97.5 %ile consumption rate	Generic mean consumption rate	Generic 97.5 %ile consumption rate
Fish	1	1	2.6	2.6	2.6	NA	ND	ND
Crustaceans	NC	NC	NC	NC	NC	NC	ND	ND
Molluscs	NC	NC	NC	NC	NC	NC	ND	ND
Wildfowl	NC	NC	NC	NC	NC	NC	ND	ND
Marine plants/algae	NC	NC	NC	NC	NC	NC	ND	ND
Salt marsh grazed sheep	NC	NC	NC	NC	NC	NC	ND	ND
Green vegetables	1	1	6.0	6.0	6.0	NA	ND	ND
Other vegetables	1	1	22.2	22.2	22.2	NA	ND	ND
Root vegetables	NC	NC	NC	NC	NC	NC	ND	ND
Potato	2	1	62.5	62.5	62.5	61.2	ND	ND
Domestic fruit	1	1	9.3	9.3	9.3	NA	ND	ND
Milk	2	2	207.4	87.5	147.5	204.4	ND	ND
Cattle meat	1	1	14.3	14.3	14.3	NA	ND	ND
Pig meat	1	1	8.6	8.6	8.6	NA	ND	ND
Sheep meat	NC	NC	NC	NC	NC	NC	ND	ND
Poultry	NC	NC	NC	NC	NC	NC	ND	ND
Eggs	1	1	11.1	11.1	11.1	NA	ND	ND
Wild/free foods	2	1	1.4	1.4	1.4	1.3	ND	ND
Rabbits/hares	NC	NC	NC	NC	NC	NC	ND	ND
Honey	NC	NC	NC	NC	NC	NC	ND	ND
Wild fungi	1	1	0.2	0.2	0.2	NA	ND	ND
Venison	NC	NC	NC	NC	NC	NC	ND	ND
Freshwater fish	NC	NC	NC	NC	NC	NC	ND	ND

Notes

ND = not determined

NC = not consumed

NA = not applicable

For 1 observation, the terms maximum, minimum and mean are not strictly valid

Table 15. Summary of 1 year old children's consumption rates in the Hinkley Point area (kg/y)

Food group	Number of observations	No. higher rate consumers	Observed maximum critical group consumption rate	Observed minimum critical group consumption rate	Observed mean critical group consumption rate	Observed 97.5 %ile consumption rate	Generic mean consumption rate	Generic 97.5 %ile consumption rate
Fish	1	1	2.6	2.6	2.6	NA	ND	ND
Crustaceans	NC	NC	NC	NC	NC	NC	ND	ND
Molluscs	NC	NC	NC	NC	NC	NC	ND	ND
Wildfowl	NC	NC	NC	NC	NC	NC	ND	ND
Marine plants/algae	NC	NC	NC	NC	NC	NC	ND	ND
Salt marsh grazed sheep	NC	NC	NC	NC	NC	NC	ND	ND
Green vegetables	NC	NC	NC	NC	NC	NC	ND	ND
Other vegetables	NC	NC	NC	NC	NC	NC	ND	ND
Root vegetables	NC	NC	NC	NC	NC	NC	ND	ND
Potato	NC	NC	NC	NC	NC	NC	ND	ND
Domestic fruit	NC	NC	NC	NC	NC	NC	ND	ND
Milk	NC	NC	NC	NC	NC	NC	ND	ND
Cattle meat	NC	NC	NC	NC	NC	NC	ND	ND
Pig meat	NC	NC	NC	NC	NC	NC	ND	ND
Sheep meat	NC	NC	NC	NC	NC	NC	ND	ND
Poultry	NC	NC	NC	NC	NC	NC	ND	ND
Eggs	NC	NC	NC	NC	NC	NC	ND	ND
Wild/free foods	NC	NC	NC	NC	NC	NC	ND	ND
Rabbits/hares	NC	NC	NC	NC	NC	NC	ND	ND
Honey	NC	NC	NC	NC	NC	NC	ND	ND
Wild fungi	NC	NC	NC	NC	NC	NC	ND	ND
Venison	NC	NC	NC	NC	NC	NC	ND	ND
Freshwater fish	NC	NC	NC	NC	NC	NC	ND	ND

Notes
ND = not determined
NC = not consumed
NA = not applicable

Table 16. Intertidal occupancy rates in the Hinkley Point area (h/y) for adults and children

Observation number	Location[a]	Activity[a]	Mud	Mud and sand	Mud, sand and stones	Rock	Salt marsh	Sand	Sand and stones	Houseboat on mud
123	**Stolford**	**Set netting and stake netting[b]**	**1560**							
125	**Stolford**	**Set netting and stake netting[b]**	**1560**							
126	**Stolford**	**Stake netting[b]**	**780**							
195	Blue Anchor	Stake netting	368							
116-120	River Parrett	River bailiff	200							
275-276	Various beaches	Angling	30			30				
114	Combwich	Fixing moorings	10							
	Shurton Bars and Kilve/Stert	**Angling/Walking**		**520**						
	River Parrett	Wildfowling					40			
301-306	Blue Anchor	Bait digging	10							
	Kilve/Kilve and Blue Anchor	Angling		10					80	
45	River Brue	Fixing moorings	10							
180	**Blue Anchor**	**Stake netting[b]**		**1515**						
182	**Blue Anchor**	**Stake netting[b]**		**1515**						
46	**Burnham-on-Sea Beach**	**Angling**		**1200**						
350	**Burnham and Berrow**	**Bait digging[b] and shore angling**		**1092**						
104	Burnham-on-Sea Beach	Walking		400						
115	Stert Beach	Walking		400						
170	Blue Anchor Beach	Long-lining		210						
240	Stolford Beach	Dog walking and horse riding		156						
74-75	Burnham-on-Sea Beach	Angling and bait digging		150						
172	Blue Anchor	Long-lining		126						
49-50	Burnham-on-Sea Beach	Dog walking		100						
183	Blue Anchor to Stert	Coastguard duties		60						
76-79	Berrow Beach	Horse riding		50						
278	Stert Beach	Dog walking		26						
31	Doniford Beach	Walking		10						
294	**Burnham-on-Sea and Lilstock**	**Playing**			**182**					
295[c]	**Burnham-on-Sea and Lilstock**	**Playing**			**182**					
277	**Various beaches**	**Bird watching and dog walking**			**130**					
245	**Various beaches**	**Dog walking**			**104**					
246	**Various beaches**	**Dog walking**			**104**					
283	**Stolford and Stert**	**Dog walking**			**104**					
296	Various beaches/Shurton Bars	Dog walking/Angling			48	28				
297	Various beaches	Dog walking			48					
247-248	Stert Beach	Walking			15					
249[c]-250[c]	Stert Beach	Walking			15					
314-315	Doniford Beach	Dog walking			13					
290	Various beaches/Stolford	Playing/Angling			12				72	
289	Stert Beach	Dog walking			12					
291	Various beaches	Playing			12					
292[c], 293[c]	Various beaches	Playing			12					

Table 16. Intertidal occupancy rates in the Hinkley Point area (h/y) for adults and children

Observation number	Location[a]	Activity[a]	Mud	Mud and sand	Mud, sand and stones	Rock	Salt marsh	Sand	Sand and stones	Houseboat on mud
316-317	Doniford and Blue Anchor	Dog walking			12					
318[c], 319[c], 320[c]	Doniford and Blue Anchor	Dog walking			12					
288	Stert Beach	Dog walking			6					
321-324	Kilve Beach	Playing			6					
325[c], 326[c]	Kilve Beach	Playing			7					
220-221	Various beaches	Walking			4					
222[c], 223[c]	Various beaches	Walking			4					
261-264	Stolford Beach	Dog walking			4					
331-332	Kilve Beach	Dog walking			2					
210	**Kilve Beach**	**Fossil hunting**				**100**				
211	**Kilve Beach**	**Fossil hunting**				**100**				
298	**Lilstock/**Burnham-on-Sea	**Angling**				**65**		65		
299	**Lilstock/**Burnham-on-Sea	**Angling**				**65**		65		
300	**Lilstock/**Burnham-on-Sea	**Angling**				**65**		65		
310	**Various beaches**	**Angling**				**48**				
343-348	Hinkley Point and Kilve/Berrow and Brean	Angling				9		9		
327-328	Kilve Beach	Fossil hunting				6				
329[c], 330[c]	Kilve Beach	Fossil hunting				6				
141	**Stert**	**Marsh warden**					**520**			
260	**Stolford to Stert**	**Tending livestock**					**243**			
142	Stert	Tending livestock					153			
121-122	Stolford and Stert	Dog walking					52			
66	**Burnham-on-Sea Beach**	**Deckchair rental**						**840**		
354	**Burnham-on-Sea Beach**	**Beach warden**						**641**		
355	**Burnham-on-Sea Beach**	**Beach warden**						**641**		
356	**Burnham-on-Sea Beach**	**Beach warden**						**641**		
357	**Burnham-on-Sea Beach**	**Beach warden**						**641**		
338	**Berrow Beach**	**Beach warden**						**546**		
339	**Berrow Beach**	**Beach warden**						**546**		
340	**Berrow Beach**	**Beach warden**						**546**		
341	**Berrow Beach**	**Beach warden**						**390**		
342	**Berrow Beach**	**Beach warden**						**390**		
178	**Blue Anchor Beach**	**Dog walking**						**350**		
179	**Blue Anchor Beach**	**Dog walking**						**350**		
67-69	Burnham-on-Sea Beach	Operating donkey rides						170		
333-334	Brean Beach	Playing						160		
335[c],336[c],337[c]	Brean Beach	Playing						160		
70-73	Burnham-on-Sea Beach	Operating donkey rides						150		
94	Stert Beach	Dog walking						130		
190-192	Blue Anchor to Stert	Angling						100		

Table 16. Intertidal occupancy rates in the Hinkley Point area (h/y) for adults and children

Observation number	Location[a]	Activity[a]	Mud	Mud and sand	Mud, sand and stones	Rock	Salt marsh	Sand	Sand and stones	Houseboat on mud
212	Hinkley Point Beach	Beach combing						60		
80-82[c]	Burnham-on-Sea Beach	Kite flying						30		
47-48[c]	Burnham-on-Sea Beach	Playing						20		
251-252	Stert Beach	Playing						10		
253[c]-254[c]	Stert Beach	Playing						10		
255[c]	Stert Beach	Playing						10		
349	Brean Down	Angling						5		
202	**Blue Anchor and St Audrie's**	**Angling**							**672**	
87	Lilstock Beach	Dog walking							100	
83	Lilstock and Kilve	Walking							40	
84[c],85[c],86[c]	Lilstock and Kilve	Walking							40	
257	Kilve and Stert	Dog walking							35	
259[c]	Kilve and Stert	Dog walking							35	
307	**Watchet Harbour**	**Living on a houseboat (tide out)**								**5046**
308	**Watchet Harbour**	**Living on a houseboat (tide out)**								**5046**
309	**Watchet Harbour**	**Living on a houseboat (tide out)**								**2808**
105	**Watchet Harbour**	**Living on a houseboat (tide out)**								**2066**

Notes

Emboldened observations are the critical group members
The critical group intertidal occupancy rate over mud based on 3 observations is 1300 h/y
The observed 97.5 percentile rate based on 19 observations for mud is 1560 h/y
The critical group intertidal occupancy rate over mud and sand based on 5 observations is 1168 h/y
The observed 97.5 percentile rate based on 27 observations for mud and sand is 1515 h/y
The critical group intertidal occupancy rate over mud, sand and stones based on 6 observations is 134 h/y
The observed 97.5 percentile rate based on 41 observations for mud, sand and stones is 182 h/y
The critical group intertidal occupancy rate over rock based on 6 observations is 74 h/y
The observed 97.5 percentile rate based on 19 observations for rock is 100 h/y
The critical group intertidal occupancy rate over salt marsh based on 2 observations is 382 h/y
The observed 97.5 percentile rate based on 6 observations for salt marsh is 485 h/y
The critical group intertidal occupancy rate over sand based on 12 observations is 544 h/y
The observed 97.5 percentile rate based on 49 observations for sand is 641 h/y
The critical group intertidal occupancy rate over sand and stones based on 1 observation is 672 h/y
The observed 97.5 percentile rate based on 15 observations for sand and stones is 472 h/y
The critical group intertidal occupancy rate for living on a houseboat over mud based on 4 observations is 3742 h/y
The observed 97.5 percentile rate based on 4 observations for living on a houseboat over mud is 5046 h/y

[a] The forward slash (/), separates the locations and activities for an individual over different substrates.
Where an individual is undertaking >1 activity at >1 location, information for this individual relating to each substrate is on a separate line.
[b] Commercial activity
[c] Child observations

Table 17. Gamma dose rate measurements over intertidal substrates and a boat dwelling in the Hinkley Point area (µGy/h)

Location	NGR	Substrate	Gamma dose rate at 1 metre
Stolford	ST 237 458	Salt marsh	0.078
Stolford	ST 237 462	Mud	0.076
Stert	ST 265 455	Salt marsh	0.066
Stert	ST 282 467	Salt marsh	0.084
Blue Anchor Beach	ST 036 440	Mud and sand	0.067
Blue Anchor Beach	ST 035 437	Sand	0.071
Brean Beach	ST 295 575	Sand	0.054
Watchet Harbour	ST 073 434	Mud	0.055
Watchet Harbour	ST 073 435	Houseboat - over mud	0.055
Watchet Harbour	ST 073 435	Houseboat - over mud	0.068
Kilve Beach	ST 143 446	Sand	0.068
River Brue	ST 312 473	Mud	0.065
Burnham-on-Sea Beach	ST 301 497	Sand	0.053
Berrow Beach	ST 290523	Mud and sand	0.048
Doniford Beach	ST 088 432	Sand	0.067

Table 18. Handling rates of fishing gear and sediment in the Hinkley Point area (h/y) for adults

Observation number	Location	Activity	Fishing gear	Sediment
123	**Stolford**	**Gear handling[a]**	**1560**	
125	**Stolford**	**Gear handling[a]**	**1560**	
180	**Blue Anchor**	**Gear handling[a]**	**1515**	
182	**Blue Anchor**	**Gear handling[a]**	**1515**	
126	**Stolford**	**Gear handling[a]**	**780**	
195	Blue Anchor	Gear handling	436	
170	Blue Anchor	Gear handling	210	
172	Blue Anchor	Gear handling	126	
350	**Burnham-on-Sea and Berrow**	**Bait digging[a]**		**780**
114	Combwich and River Parrett	Fixing moorings and wildfowling		50
74	Burnham-on-Sea Beach	Bait digging		20
75	Burnham-on-Sea Beach	Bait digging		20
45	River Brue	Fixing moorings		10
301	Blue Anchor Beach	Bait digging		10
302	Blue Anchor Beach	Bait digging		10
303	Blue Anchor Beach	Bait digging		10
304	Blue Anchor Beach	Bait digging		10
305	Blue Anchor Beach	Bait digging		10
306	Blue Anchor Beach	Bait digging		10

Notes

Emboldened observations are the critical group members
The critical group fishing gear handling rate based on 5 observations is 1386 h/y
The observed 97.5 percentile rate based on 8 observations for fishing gear is 1560 h/y
The critical group sediment handling rate based on 1 observation is 780 h/y
The observed 97.5 percentile rate based on 11 observations for sediment is 598 h/y

[a] Commercial activity

Table 19. Occupancy rates in and on water in the Hinkley Point area (h/y) for adults and children

Observation number	Location[a]	Activity[a]	In water	On water
104	Burnham-on-Sea/Burnham-on-Sea to Watchet	Jet skiing/Sailing	10	260
105	Watchet Harbour	Living on a houseboat (tide in)		3099
309	Watchet Harbour	Living on a houseboat (tide in)		2808
307	Watchet Harbour	Living on a houseboat (tide in)		2522
308	Watchet Harbour	Living on a houseboat (tide in)		2522
188	Blue Anchor to Stert	Charter boat skipper		1560
186	Blue Anchor to Stert	Charter boat skipper		1120
286	Bridgwater Bay	Boat angling		600
103	Burnham-on-Sea to Watchet	Sailing		530
100	Burnham-on-Sea to Watchet	Sailing		480
102	Burnham-on-Sea to Watchet	Sailing		420
358	Watchet Harbour	Boat maintenance		420
44	Bridgwater Bay	Sailing		400
98-99	Burnham-on-Sea to Watchet	Sailing		400
101	Burnham-on-Sea to Watchet	Sailing		260
114	Bridgwater Bay	Sailing		240
51-65	Brean Down to Hinkley Point	RNLI		230
350	Bridgwater Bay	Boat angling		144
45	Bridgwater Bay	Sailing		100
190-192	Blue Anchor to Stert	Boat angling		100
195	Blue Anchor Beach	Push netting		68
95-96	Burnham-on-Sea to Watchet	Sailing		60
97[b]	Burnham-on-Sea to Watchet	Sailing		60
333-334	Brean Beach	Canoeing		40
335[b]	Brean Beach	Canoeing		40
336[b]	Brean Beach	Canoeing		40
337[b]	Brean Beach	Canoeing		40
296	Bridgwater Bay	Boat angling		24

Notes

[a] The forward slash (/), separates the locations and activities in and on water for that individual.

[b] Observation numbers 97, 335, 336 and 337 are for children aged 10, 9, 12 and 14 respectively.

Table 20. Adults' consumption rates of green vegetables in the Hinkley Point area (kg/y)

Observation number	Artichoke	Asparagus	Broccoli	Brussel sprout	Cabbage	Cauliflower	Courgette	Cucumber	Herbs	Leaf beet	Lettuce	Pak choi	Rocket	Spinach	Total
245	**23.6**	**9.1**	**13.5**	**1.6**	**11.0**	**6.7**		**3.8**			**11.3**				**80.6**
246	**23.6**	**9.1**	**13.5**	**1.6**	**11.0**	**6.7**		**3.8**			**11.3**				**80.6**
205			**15.0**		**36.5**										**51.5**
226			**6.5**	**7.6**	**12.2**	**6.5**		**6.8**		**4.2**	**2.0**				**45.8**
227			**6.5**	**7.6**	**12.2**	**6.5**		**6.8**		**4.2**	**2.0**				**45.8**
228			**6.5**	**7.6**	**12.2**	**6.5**		**6.8**		**4.2**	**2.0**				**45.8**
164	**1.4**			**2.3**	**2.1**		**9.2**	**8.5**			**5.0**		**2.7**	**3.4**	**34.6**
165	**1.4**			**2.3**	**2.1**		**9.2**	**8.5**			**5.0**		**2.7**	**3.4**	**34.6**
153			**5.1**		**8.5**			**8.5**			**10.0**				**32.1**
154			**5.1**		**8.5**			**8.5**			**10.0**				**32.1**
149			**6.8**		**12.8**	**10.2**									**29.8**
150			**6.8**		**12.8**	**10.2**									**29.8**
279-282			2.5	6.8		12.5		2.5			2.0				26.3
166-169	0.7			1.1	1.1		4.6	4.3			2.5		1.9	1.7	17.8
34-37					14.9										14.9
38-41			2.0	1.2	3.2		2.6					3.9			12.9
206-207					12.8										12.8
88-89				2.7	7.3	2.2									12.3
32-33					6.1	3.7									9.8
261-266			1.5		3.0	1.5	2.7				1.0				9.8
160-161								8.5							8.5
146											8.0				8.0
155-157			0.5				2.5				2.0			1.5	6.4
251-252	2.9						0.7				2.4				6.0
283-285								5.7							5.7
158-159					5.1										5.1
208-209											5.0				5.0
256-258											4.5				4.5
90-92				0.5	1.2	0.4									2.0
247-248											1.5				1.5
269-270											1.4				1.4
147-148		0.7							0.5						1.1

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of green vegetables based on the 12 highest adult consumers is 45.2 kg/y

The observed 97.5 percentile rate based on 67 observations is 61.7 kg/y

Table 21. Adults' consumption rates of other vegetables in the Hinkley Point area (kg/y)

Observation number	Aubergine	Broad bean	Chilli pepper	French bean	Pea	Pepper	Runner bean	Squash	Sweetcorn	Tomato	Total
153	**15.3**	**5.6**			**3.6**	**7.4**	**15.3**			**45.0**	**92.2**
154	**15.3**	**5.6**			**3.6**	**7.4**	**15.3**			**45.0**	**92.2**
245	**6.4**	**10.6**	**1.2**	**5.8**	**7.3**	**5.5**	**7.3**		**2.5**	**42.9**	**89.6**
246	**6.4**	**10.6**	**1.2**	**5.8**	**7.3**	**5.5**	**7.3**		**2.5**	**42.9**	**89.6**
205		**18.2**			**27.0**		**27.2**				**72.4**
226		**9.1**		**4.8**	**12.6**		**9.2**	**7.9**	**4.6**	**5.5**	**53.5**
228				**4.8**	**12.6**		**9.2**	**7.9**	**4.6**	**5.5**	**44.4**
227				**4.8**	**12.6**		**9.2**	**7.9**	**4.6**		**39.0**
146							**20.0**			**10.8**	**30.8**
279-282		3.0			1.3		7.5			12.5	24.3
32-33		9.1		7.2			6.8				23.1
88-89		5.5			5.4		11.4				22.3
251-252		5.5		1.4	3.6		3.3		0.6	8.0	22.2
123-124		20.5									20.5
256-258	0.5	3.4				0.5	10.2			5.4	20.0
218-219		4.6					13.6				18.2
247-248		2.5		7.5			5.1		1.2		16.3
206-207							9.1	6.8			15.9
38-41		2.4			3.5		9.5				15.5
283-285						0.3				14.4	14.7
164-165				4.1						8.1	12.2
34-37		3.6		2.9			5.4				12.0
144-145		5.7		5.7							11.3
149-150							11.3				11.3
160-161										10.8	10.8
261-266		1.5		1.5			3.8			1.5	8.3
17-18					2.5		5.0				7.5
158-159							6.8				6.8
147-148		2.3					4.5				6.8
166-169				2.0						4.1	6.1
269-270		1.3					4.6				5.9
90-92		0.9			0.9		1.9				3.7

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of other vegetables based on the 9 highest adult consumers is 67.1 kg/y

The observed 97.5 percentile rate based on 70 observations is 90.3 kg/y

Table 22. Adults' consumption rates of root vegetables in the Hinkley Point area (kg/y)

Observation number	Beetroot	Carrot	Celeriac	Celery	Fennel	Garlic	Leek	Onion	Parsnip	Radish	Salsify	Shallot	Spring onion	Turnip	Total
245		**7.3**	**3.5**	**5.8**	**14.7**		**4.9**	**16.2**	**2.9**			**3.8**	**1.1**	**2.9**	**63.1**
246		**7.3**	**3.5**	**5.8**	**14.7**		**4.9**	**16.2**	**2.9**			**3.8**	**1.1**	**2.9**	**63.1**
32	**8.2**	**9.0**					**6.8**	**25.2**	**7.2**						**56.4**
33	**8.2**	**9.0**					**6.8**	**25.2**	**7.2**						**56.4**
149	**24.6**	**3.4**						**19.1**							**47.0**
205		**9.0**					**9.0**	**7.2**	**7.2**						**32.4**
226	**5.5**	**6.8**				**0.4**	**6.0**	**1.5**	**2.4**	**1.2**	**1.2**		**1.3**		**26.3**
227	**5.5**	**6.8**				**0.4**	**6.0**	**1.5**	**2.4**	**1.2**	**1.2**		**1.3**		**26.3**
228	**5.5**	**6.8**				**0.4**	**6.0**	**1.5**	**2.4**	**1.2**	**1.2**		**1.3**		**26.3**
150		**3.4**						**19.1**							**22.4**
151		**3.4**						**19.1**							**22.4**
152		**3.4**						**19.1**							**22.4**
279	**6.3**	**2.5**						**3.0**	**6.3**	**1.3**		**2.0**	**0.3**		**21.5**
280	**6.3**	**2.5**						**3.0**	**6.3**	**1.3**		**2.0**	**0.3**		**21.5**
281	**6.3**	**2.5**						**3.0**	**6.3**	**1.3**		**2.0**	**0.3**		**21.5**
282	**6.3**	**2.5**						**3.0**	**6.3**	**1.3**		**2.0**	**0.3**		**21.5**
123-124								10.8				9.6			20.4
256-258	3.1	10.1						4.1					1.5		18.8
269-270	7.4	4.1						4.1	3.2						18.7
88-89	2.5	2.7						2.2		0.5		5.8			13.6
153-154	4.9		1.6						4.5	2.2					13.2
34-37		1.8					3.6	5.8	1.4						12.6
144-145								11.3							11.3
38-41	4.3	3.5						2.8							10.7
164-165							5.0	5.5							10.5
17-18	6.3	3.8													10.0
261-266	3.8	0.8					1.9	1.5							7.9
247-248	0.9	6.3													7.2
208-209		1.4						5.5							6.9
206-207		6.8													6.8
166-169							2.5	2.8							5.3
218-219		4.5													4.5
155-157						0.3	2.0	1.5							3.7
90-92	0.4	0.5						0.4		0.1		1.0			2.3

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of root vegetables based on the 16 highest adult consumers is 34.4 kg/y

The observed 97.5 percentile rate based on 65 observations is 59.0 kg/y

Table 23. Adults' consumption rates of potato in the Hinkley Point area (kg/y)

Observation number	Potato
279	**100.0**
280	**100.0**
281	**100.0**
282	**100.0**
149	**82.6**
150	**82.6**
151	**82.6**
152	**82.6**
123	**81.9**
124	**81.9**
218	**62.5**
219	**62.5**
220	**62.5**
221	**62.5**
224	**62.5**
225	**62.5**
205	**54.6**
144	**50.8**
145	**50.8**
261	**42.3**
262	**42.3**
263	**42.3**
264	**42.3**
265	**42.3**
266	**42.3**
245	**39.2**
246	**39.2**
226	**38.7**
227	**38.7**
228	**38.7**
32	**36.4**
33	**36.4**
256	**34.1**
257	**34.1**
258	**34.1**
153-154	30.3
34-37	27.3
208-209	25.4
206-207	22.7
88-89	21.8
269-270	20.5
164-165	12.6
17-18	10.0
251-252	8.7
38-39	6.8
40-41	6.8
158-159	6.8
166-169	6.3
247-248	6.3
90-92	3.6

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of potato based on the 35 highest adult consumers is 58.5 kg/y

The observed 97.5 percentile rate based on 70 observations is 100.0 kg/y

Table 24. Adults' consumption rates of domestic fruit in the Hinkley Point area (kg/y)

Observation number	Apple	Blackberry	Blackcurrant	Cherry	Damson	Fig	Gooseberry	Greengage	Lemon	Loganberry	Melon	Orange	Peach	Pear	Plum	Quince	Raspberry	Redcurrant	Rhubarb	Strawberry	Tayberry	Walnut	Whitecurrant	Total
205			**22.7**							**20.4**							**6.8**		**22.7**					**72.5**
164	**11.3**		**8.5**		**3.4**	**0.9**	**3.1**							**5.7**	**3.4**	**3.4**	**13.6**		**5.7**	**4.8**			**1.1**	**64.8**
165	**11.3**		**8.5**		**3.4**	**0.9**	**3.1**							**5.7**	**3.4**	**3.4**	**13.6**		**5.7**	**4.8**			**1.1**	**64.8**
228				**0.3**		**0.5**	**0.5**			**5.3**				**2.3**	**0.8**		**27.1**		**3.2**	**15.9**	**5.3**	**0.8**		**61.8**
227				**0.3**		**0.5**				**5.3**				**2.3**	**0.8**		**27.1**		**3.2**	**15.9**	**5.3**	**0.8**		**61.4**
226				**0.3**		**0.5**				**5.3**				**2.3**	**0.8**		**27.1**		**3.2**	**15.9**	**5.3**	**0.8**		**61.4**
245	**17.0**		**2.0**				**2.0**		**0.2**		**4.9**	**2.4**		**5.0**	**5.1**		**4.0**	**2.4**	**4.1**		**2.4**	**1.5**		**53.2**
246	**17.0**		**2.0**				**2.0**		**0.2**		**4.9**	**2.4**		**5.0**	**5.1**		**4.0**	**2.4**	**4.1**		**2.4**	**1.5**		**53.2**
149	**25.4**													**12.7**					**2.3**					**40.4**
150	**25.4**													**12.7**					**2.3**					**40.4**
17	**35.0**																							**35.0**
18	**35.0**																							**35.0**
279	**25.0**						**2.0**							**6.3**										**33.3**
280	**25.0**						**2.0**							**6.3**										**33.3**
281	**25.0**						**2.0**							**6.3**										**33.3**
282	**25.0**						**2.0**							**6.3**										**33.3**
166	**5.7**		**4.3**		**1.7**	**0.5**	**1.5**							**2.8**	**1.7**	**1.7**	**6.8**		**1.8**	**2.4**			**0.6**	**31.4**
167	**5.7**		**4.3**		**1.7**	**0.5**	**1.5**							**2.8**	**1.7**	**1.7**	**6.8**		**1.8**	**2.4**			**0.6**	**31.4**
168	**5.7**		**4.3**		**1.7**	**0.5**	**1.5**							**2.8**	**1.7**	**1.7**	**6.8**		**1.8**	**2.4**			**0.6**	**31.4**
169	**5.7**		**4.3**		**1.7**	**0.5**	**1.5**							**2.8**	**1.7**	**1.7**	**6.8**		**1.8**	**2.4**			**0.6**	**31.4**
160	**8.2**													**11.3**	**9.1**									**28.6**
161	**8.2**													**11.3**	**9.1**									**28.6**
206-207	6.8							2.3						0.7			11.3					2.3		23.4
261-266	3.0		0.8				0.8						0.9	3.0			2.3	0.4	2.3	3.0				16.4
256-258	6.8			0.2											2.3				2.8					12.1
283-285	4.5										0.7				6.0									11.3
32-33																				10.7				10.7
153-154	4.5	2.3												1.4	1.1									9.3
251-252	3.6		0.5				0.3								1.8			0.3	2.7					9.3

Table 24. Adults' consumption rates of domestic fruit in the Hinkley Point area (kg/y)

Observation number	Apple	Blackberry	Blackcurrant	Cherry	Damson	Fig	Gooseberry	Greengage	Lemon	Loganberry	Melon	Orange	Peach	Pear	Plum	Quince	Raspberry	Redcurrant	Rhubarb	Strawberry	Tayberry	Walnut	Whitecurrant	Total
208-209																			6.8					6.8
229-231	3.3																0.7							4.0
106-107	2.5																			0.2				2.7
88-89																			2.1					2.1
247-248	0.7														1.1									1.8
34-37																			0.9					0.9
38-41																			0.8					0.8
90-92																			0.3					0.3

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of domestic fruit based on the 22 highest adult consumers is 43.6 kg/y

The observed 97.5 percentile rate based on 64 observations is 64.8 kg/y

Table 25. Adults' consumption rates of milk in the Hinkley Point area (l/y)

Observation number	Cheese[a]	Cream[a]	Milk	Total
144			**207.4**	**207.4**
215			**207.4**	**207.4**
216			**207.4**	**207.4**
213			**198.9**	**198.9**
214			**198.9**	**198.9**
229			**146.0**	**146.0**
230			**146.0**	**146.0**
231			**146.0**	**146.0**
232			**146.0**	**146.0**
233			**146.0**	**146.0**
10			**138.3**	**138.3**
11			**138.3**	**138.3**
12			**138.3**	**138.3**
279	**22.5**		**104.0**	**126.5**
236			**121.5**	**121.5**
237			**121.5**	**121.5**
280			**104.0**	**104.0**
218			**87.5**	**87.5**
219			**87.5**	**87.5**
220			**87.5**	**87.5**
221			**87.5**	**87.5**
224			**87.5**	**87.5**
225			**87.5**	**87.5**
226	28.7	7.6		36.2
227	28.7	7.6		36.2
228	28.7	7.6		36.2
277	27.0			27.0

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of milk based on the 23 highest adult consumers is 137.5 l/y

The observed 97.5 percentile rate based on 27 observations is 207.4 l/y

[a] The consumption rates of cheese and cream have been converted to the equivalent litres of milk

Table 26. Adults' consumption rates of cattle meat in the Hinkley Point area (kg/y)

Observation number	Beef
30	**60.0**
31	**60.0**
19	**47.3**
20	**47.3**
24	**47.3**
25	**47.3**
279	**47.3**
280	**47.3**
281	**47.3**
282	**47.3**
26	**37.8**
27	**37.8**
28	**37.8**
29	**37.8**
218	**28.6**
219	**28.6**
220	**28.6**
221	**28.6**
224	**28.6**
225	**28.6**
283	**23.6**
284	**23.6**
285	**23.6**
229-240	18.9
106-107	13.6
6-9	12.5
108-113	11.3

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of cattle meat based on the 23 highest adult consumers is 38.8 kg/y
The observed 97.5 percentile rate based on 47 observations is 58.1 kg/y

Table 27. Adults' consumption rates of pig meat in the Hinkley Point area (kg/y)

Observation number	Pork
17	**27.5**
18	**27.5**
234	**25.3**
235	**25.3**
236	**25.3**
237	**25.3**
218	**17.1**
219	**17.1**
220	**17.1**
221	**17.1**
224	**17.1**
225	**17.1**
238	**14.5**
239	**14.5**
240	**14.5**
241	**14.5**
242	**14.5**
243	**14.5**
244	**14.5**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of pig meat based on the 19 highest adult consumers is 19.0 kg/y
The observed 97.5 percentile rate based on 19 observations is 27.5 kg/y

Table 28. Adults' consumption rates of sheep meat in the Hinkley Point area (kg/y)

Observation number	Lamb
226	**15.1**
227	**15.1**
228	**15.1**
26	**11.3**
27	**11.3**
28	**11.3**
29	**11.3**
6	**7.1**
7	**7.1**
8	**7.1**
9	**7.1**
13	**5.7**
14	**5.7**
15	**5.7**
16	**5.7**
24	**5.7**
25	**5.7**
261	**5.7**
262	**5.7**
263	**5.7**
264	**5.7**
265	**5.7**
266	**5.7**
245	2.8
246	2.8

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of sheep meat based on the 23 highest adult consumers is 8.1 kg/y
The observed 97.5 percentile rate based on 25 observations is 15.1 kg/y
The observations exclude those for salt marsh grazed sheep (see Table 8)

Table 29. Adults' consumption rates of poultry in the Hinkley Point area (kg/y)

Observation number	Chicken	Duck	Pheasant	Pigeon	Total
17		**5.4**	**9.0**		**14.4**
18		**5.4**	**9.0**		**14.4**
19		**2.5**	**5.0**	**1.0**	**8.5**
20		**2.5**	**5.0**	**1.0**	**8.5**
279			**4.5**	**1.2**	**5.7**
280			**4.5**	**1.2**	**5.7**
30			**5.4**		**5.4**
31			**5.4**		**5.4**
226-228			4.5		4.5
206-207	2.3		0.5		2.7
261-266			2.3		2.3
34			2.0		2.0
6-9			1.4		1.4
224-225			1.4		1.4
245-246			1.4		1.4
1-2			1.1		1.1
26-29		0.3	0.3		0.7
213-214			0.5		0.5
283			0.5		0.5

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of poultry based on the 8 highest adult consumers is 8.5 kg/y
The observed 97.5 percentile rate based on 37 observations is 14.4 kg/y

Table 30. Adults' consumption rates of eggs in the Hinkley Point area (kg/y)

Observation number	Chicken egg	Duck egg	Pheasant egg	Total
162		**35.3**		**35.3**
163		**35.3**		**35.3**
146	**26.7**			**26.7**
206	**23.7**			**23.7**
207	**23.7**			**23.7**
245	**17.8**			**17.8**
246	**17.8**			**17.8**
34	**14.3**			**14.3**
35	**14.3**			**14.3**
36	**14.3**			**14.3**
37	**14.3**			**14.3**
42		**14.1**		**14.1**
43		**14.1**		**14.1**
88	**12.3**			**12.3**
89	**12.3**			**12.3**
352	**11.9**			**11.9**
353	**11.9**			**11.9**
251	11.1			11.1
252	11.1			11.1
153	8.9			8.9
154	8.9			8.9
158	8.9			8.9
159	8.9			8.9
164	8.9			8.9
165	8.9			8.9
208	8.9			8.9
209	8.9			8.9
283	7.9			7.9
284	7.9			7.9
285	7.9			7.9
279	5.2			5.2
280	5.2			5.2
32	2.9			2.9
33	2.9			2.9
278	2.1			2.1
261			0.2	0.2
262			0.2	0.2
263			0.2	0.2
264			0.2	0.2
265			0.2	0.2
266			0.2	0.2

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of eggs based on the 17 highest adult consumers is 18.5 kg/y

The observed 97.5 percentile rate based on 41 observations is 35.3 kg/y

Table 31. Adults' consumption rates of wild/free foods in the Hinkley Point area (kg/y)

Observation number	Almond	Blackberry	Bullus plum	Damson	Hazel nut	Mulberry	Sloe	Total
229		**6.7**						**6.7**
230		**6.7**						**6.7**
231		**6.7**						**6.7**
164		**4.5**						**4.5**
165		**4.5**						**4.5**
279		**4.5**						**4.5**
280		**4.5**						**4.5**
261		**0.4**				**1.1**	**2.3**	**3.8**
262		**0.4**				**1.1**	**2.3**	**3.8**
263		**0.4**				**1.1**	**2.3**	**3.8**
264		**0.4**				**1.1**	**2.3**	**3.8**
265		**0.4**				**1.1**	**2.3**	**3.8**
266		**0.4**				**1.1**	**2.3**	**3.8**
206		**2.3**	**0.1**	**1.1**				**3.5**
207		**2.3**	**0.1**	**1.1**				**3.5**
283		**3.0**					**0.5**	**3.5**
284		**3.0**					**0.5**	**3.5**
285		**3.0**					**0.5**	**3.5**
238		**0.7**					**2.3**	**2.9**
239		**0.7**					**2.3**	**2.9**
245		2.0						2.0
246		2.0						2.0
26		1.5						1.5
27		1.5						1.5
251		1.4						1.4
252		1.4						1.4
278		0.5		0.2			0.5	1.2
247	0.2	0.3			0.2		0.5	1.1
248	0.2	0.3			0.2		0.5	1.1
13		0.8						0.8
14		0.8						0.8
15		0.8						0.8
16		0.8						0.8
256		0.7						0.7
257		0.7						0.7
258		0.7						0.7
240		0.7						0.7
6							0.5	0.5
7							0.5	0.5
8							0.5	0.5
9							0.5	0.5
106		0.5						0.5
107		0.5						0.5
213		0.5						0.5
214		0.5						0.5
218		0.3						0.3
219		0.3						0.3
220		0.3						0.3
221		0.3						0.3
224		0.3						0.3
225		0.3						0.3

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of wild/free foods based on the 20 highest adult consumers is 4.2 kg/y

The observed 97.5 percentile rate based on 51 observations is 6.7 kg/y

Table 32. Adults' consumption rates of rabbits/hares in the Hinkley Point area (kg/y)

Observation number	Rabbit
19	**2.5**
20	**2.5**
279	**1.4**
280	**1.4**
34	**0.9**
35	**0.9**
36	**0.9**
37	**0.9**
226	0.8
227	0.8
228	0.8
6	0.6
7	0.6
8	0.6
9	0.6
206	0.5
207	0.5

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of rabbits/hares based on the 8 highest adult consumers is 1.4 kg/y
The observed 97.5 percentile rate based on 17 observations is 2.5 kg/y

Table 33. Adults' consumption rates of honey in the Hinkley Point area (kg/y)

Observation number	Honey
267	**5.9**
268	**5.9**
17	**3.8**
18	**3.8**
106	**3.6**
19	**2.7**
20	**2.7**
279	**2.7**
280	**2.7**
107	0.9
245	0.5
246	0.5
351	0.5
261	0.2
262	0.2
263	0.2
264	0.2

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of honey based on the 9 highest adult consumers is 3.8 kg/y
The observed 97.5 percentile rate based on 17 observations is 5.9 kg/y

Table 34. Adults' consumption rates of wild fungi in the Hinkley Point area (kg/y)

Observation number	Mushrooms
226	**2.3**
227	**2.3**
228	**2.3**
279	**1.8**
280	**1.8**
245	**0.9**
246	**0.9**
229-230	0.7
19-20	0.5
26-27	0.5
213-214	0.2
218-221	0.2
224-225	0.2

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of wild fungi based on the 7 highest adult consumers is 1.7 kg/y
The observed 97.5 percentile rate based on 21 observations is 2.3 kg/y

Table 35. Adults' consumption rates of venison in the Hinkley Point area (kg/y)

Observation number	Venison
19	**10.0**
20	**10.0**
10	1.7
11	1.7
12	1.7

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of venison based on the 2 highest adult consumers is 10.0 kg/y
The observed 97.5 percentile rate based on 5 observations is 10.0 kg/y

Table 36. Adults' consumption rates of freshwater fish in the Hinkley Point area (kg/y)

Observation number	Brown trout	Rainbow trout	Total
34	**0.6**	**0.6**	**1.2**
35	**0.6**	**0.6**	**1.2**
36	**0.6**	**0.6**	**1.2**
37	**0.6**	**0.6**	**1.2**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of freshwater fish based on the 4 highest adult consumers is 1.2 kg/y
The observed 97.5 percentile rate based on 4 observations is 1.2 kg/y

Table 37. Children's consumption rates of green vegetables in the Hinkley Point area (kg/y)

15 year old age group

Observation number	Age	Artichoke	Brussel sprout	Cabbage	Cauliflower	Courgette	Lettuce	Total
93	**15**		**0.5**	**1.2**	**0.4**			**2.0**
271	**14**						**1.4**	**1.4**
272	**12**						**1.4**	**1.4**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of green vegetables based on the 3 highest 15 year old age group consumers is 1.6 kg/y
The observed 97.5 percentile rate based on 3 observations is 2.0 kg/y

10 year old age group

Observation number	Age	Artichoke	Brussel sprout	Cabbage	Cauliflower	Courgette	Lettuce	Total
254	**9**	**2.9**				**0.7**	**2.4**	**6.0**
253	**11**	**2.9**				**0.7**	**2.4**	**6.0**
259	**9**						**4.5**	**4.5**
249	11						1.5	1.5
250	9						1.5	1.5

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of green vegetables based on the 3 highest 10 year old age group consumers is 5.5 kg/y
The observed 97.5 percentile rate based on 5 observations is 6.0 kg/y

5 year old age group

Observation number	Age	Artichoke	Brussel sprout	Cabbage	Cauliflower	Courgette	Lettuce	Total
255	**6**	**2.9**				**0.7**	**2.4**	**6.0**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of green vegetables based on the only 5 year old age group consumer is 6.0 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

Table 38. Children's consumption rates of other vegetables in the Hinkley Point area (kg/y)

15 year old age group

Observation number	Age	Aubergine	Broad bean	French bean	Pea	Pepper	Runner bean	Sweetcorn	Tomato	Total
271	**14**		**1.3**				**4.6**			**5.9**
272	**12**		**1.3**				**4.6**			**5.9**
93	**15**		**0.9**		**0.9**		**1.9**			**3.7**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of other vegetables based on the 3 highest 15 year old age group consumers is 5.1 kg/y
The observed 97.5 percentile rate based on 3 observations is 5.9 kg/y

10 year old age group

Observation number	Age	Aubergine	Broad bean	French bean	Pea	Pepper	Runner bean	Sweetcorn	Tomato	Total
253	**11**		**5.5**	**1.4**	**3.6**		**3.3**	**0.6**	**7.0**	**22.2**
254	**9**		**5.5**	**1.4**	**3.6**		**3.3**	**0.6**	**7.0**	**22.2**
259	**9**	**0.5**	**3.4**			**0.5**	**10.2**		**5.4**	**20.0**
249	**11**		**2.5**	**7.5**			**5.1**	**1.2**		**16.3**
250	**9**		**2.5**	**7.5**			**5.1**	**1.2**		**16.3**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of other vegetables based on the 5 highest 10 year old age group consumers is 19.4 kg/y
The observed 97.5 percentile rate based on 5 observations is 22.2 kg/y

5 year old age group

Observation number	Age	Aubergine	Broad bean	French bean	Pea	Pepper	Runner bean	Sweetcorn	Tomato	Total
255	**6**		**5.5**	**1.4**	**3.6**		**3.3**	**0.6**	**7.0**	**22.2**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of other vegetables based on the only 5 year old age group consumer is 22.2 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

Table 39. Children's consumption rates of root vegetables in the Hinkley Point area (kg/y)

15 year old age group

Observation number	Age	Beetroot	Carrot	Onion	Parsnip	Radish	Shallot	Spring onion	Total
271	**14**	**7.4**	**4.1**	**4.1**	**3.2**				**18.7**
272	**12**	**7.4**	**4.1**	**4.1**	**3.2**				**18.7**
93	15	0.4	0.5	0.4		0.1	1.0		2.3

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of root vegetables based on the 2 highest 15 year old age group consumers is 18.7 kg/y

The observed 97.5 percentile rate based on 3 observations is 18.7 kg/y

10 year old age group

Observation number	Age	Beetroot	Carrot	Onion	Parsnip	Radish	Shallot	Spring onion	Total
259	**9**	**3.1**	**10.1**	**4.1**				**1.5**	**18.8**
249	**11**	**0.9**	**6.3**						**7.2**
250	**9**	**0.9**	**6.3**						**7.2**

Notes

Emboldened observations are the critical group consumers

The critical group consumption rate of root vegetables based on the 3 highest 10 year old age group consumers is 11.0 kg/y

The observed 97.5 percentile rate based on 3 observations is 18.2 kg/y

Table 40. Children's consumption rates of potato in the Hinkley Point area (kg/y)

15 year old age group

Observation number	Age	Potato
271	**14**	**20.5**
272	**12**	**20.5**
93	15	3.6

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of potato based on the 2 highest 15 year old age group consumers is 20.5 kg/y
The observed 97.5 percentile rate based on 3 observations is 20.5 kg/y

10 year old age group

Observation number	Age	Potato
222	**7**	**62.5**
259	**9**	**34.1**
253	11	8.7
254	9	8.7
249	11	6.3
250	9	6.3

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of potato based on the 2 highest 10 year old age group consumers is 48.3 kg/y
The observed 97.5 percentile rate based on 6 observations is 59.0 kg/y

5 year old age group

Observation number	Age	Potato
223	**5**	**62.5**
255	6	8.7

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of potato based on the only 5 year old age group consumer is 62.5 kg/y
The observed 97.5 percentile rate based on 2 observations is 61.2 kg/y

Table 41. Children's consumption rates of domestic fruit in the Hinkley Point area (kg/y)

15 year old age group

Observation number	Age	Apple	Blackcurrant	Cherry	Gooseberry	Plum	Redcurrant	Rhubarb	Total
93	**15**							**0.3**	**0.3**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of domestic fruit based on the only 15 year old age group consumer is 0.3 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

10 year old age group

Observation number	Age	Apple	Blackcurrant	Cherry	Gooseberry	Plum	Redcurrant	Rhubarb	Total
259	**9**	**6.8**		**0.2**		**2.3**		**2.8**	**12.1**
253	**11**	**3.6**	**0.5**		**0.3**	**1.8**	**0.3**	**2.7**	**9.3**
254	**9**	**3.6**	**0.5**		**0.3**	**1.8**	**0.3**	**2.7**	**9.3**
249	11	0.7				1.1			1.8
250	9	0.7				1.1			1.8

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of domestic fruit based on the 3 highest 10 year old age group consumers is 10.2 kg/y
The observed 97.5 percentile rate based on 5 observations is 11.8 kg/y

5 year old age group

Observation number	Age	Apple	Blackcurrant	Cherry	Gooseberry	Plum	Redcurrant	Rhubarb	Total
255	**6**	**3.6**	**0.5**		**0.3**	**1.8**	**0.3**	**2.7**	**9.3**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of domestic fruit based on the only 5 year old age group consumer is 9.3 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

Table 42. Children's consumption rates of milk in the Hinkley Point area (l/y)

10 year old age group

Observation number	Age	Milk
222	**7**	**87.5**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of milk based on the only 10 year old age group consumer is 87.5 l/y
The observed 97.5 percentile rate is not applicable for 1 observation

5 year old age group

Observation number	Age	Milk
217	**3**	**207.4**
223	**5**	**87.5**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of milk based on the 2 highest 5 year old age group consumers is 147.5 l/y
The observed 97.5 percentile rate based on 2 observations is 204.4 l/y

Table 43. Children's consumption rates of cattle meat in the Hinkley Point area (kg/y)

10 year old age group

Observation number	Age	Beef
222	**7**	**14.3**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of cattle meat based on the only 10 year old age group consumer is 14.3 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

5 year old age group

Observation number	Age	Beef
223	**5**	**14.3**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of cattle meat based on the only 5 year old age group consumer is 14.3 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

Table 44. Children's consumption rates of pig meat in the Hinkley Point area (kg/y)

10 year old age group

Observation number	Age	Pork
222	**7**	**8.6**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of pig meat based on the only 10 year old age group consumer is 8.6 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

5 year old age group

Observation number	Age	Pork
223	**5**	**8.6**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of pig meat based on the only 5 year old age group consumer is 8.6 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

Table 45. Children's consumption rates of poultry in the Hinkley Point area (kg/y)

15 year old age group

Observation number	Age	Pheasant
3	**14**	**1.1**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of poultry based on the only 15 year old age group consumer is 1.1 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

10 year old age group

Observation number	Age	Pheasant
4	**11**	**1.1**
5	**9**	**1.1**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of poultry based on the 2 highest 10 year old age group consumers is 1.1 kg/y
The observed 97.5 percentile rate based on 2 observations is 1.1 kg/y

Table 46. Children's consumption rates of eggs in the Hinkley Point area (kg/y)

10 year old age group

Observation number	Age	Chicken egg
253	**11**	**11.1**
254	**9**	**11.1**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of eggs based on the 2 highest 10 year old age group consumers is 11.1 kg/y
The observed 97.5 percentile rate based on 2 observations is 11.1 kg/y

5 year old age group

Observation number	Age	Chicken egg
255	**6**	**11.1**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of eggs based on the only 5 year old age group consumer is 11.1 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

Table 47. Children's consumption rates of wild/free foods in the Hinkley Point area (kg/y)

10 year old age group

Observation number	Age	Almond	Blackberry	Hazel nut	Total
253	**11**		**1.4**		**1.4**
254	**9**		**1.4**		**1.4**
259	**9**		**0.7**		**0.7**
249	**11**	**0.2**	**0.3**	**0.2**	**0.6**
250	**9**	**0.2**	**0.3**	**0.2**	**0.6**
222	7		0.3		0.3

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of wild/free foods based on the 5 highest 10 year old age group consumers is 0.9 kg/y
The observed 97.5 percentile rate based on 6 observations is 1.4 kg/y

5 year old age group

Observation number	Age	Almond	Blackberry	Hazel nut	Total
255	**6**		**1.4**		**1.4**
223	5		0.3		0.3

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of wild/free foods based on the only 5 year old consumer is 1.4 kg/y
The observed 97.5 percentile rate based on 2 observations is 1.3 kg/y

Table 48. Children's consumption rates of wild fungi in the Hinkley Point area (kg/y)

10 year old age group

Observation number	Age	Mushrooms
222	**7**	**0.2**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of wild fungi based on the only 10 year old age group consumer is 0.2 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

5 year old age group

Observation number	Age	Mushrooms
223	**5**	**0.2**

Notes
Emboldened observations are the critical group consumers
The critical group consumption rate of wild fungi based on the only 5 year old age group consumer is 0.2 kg/y
The observed 97.5 percentile rate is not applicable for 1 observation

Table 49. Percentage contribution each food type makes to its terrestrial food group for adults

Green vegetables	
***Cabbage**	28.0 %
Lettuce	12.1 %
Cauliflower	11.6 %
Cucumber	11.4 %
Broccoli	10.5 %
Brussel sprout	6.9 %
Courgette	6.7 %
Artichoke	5.4 %
Asparagus	1.8 %
Spinach	1.7 %
Pak choi	1.5 %
Rocket	1.2 %
Leaf beet	1.2 %
Herbs	0.1 %
Other vegetables	
***Runner bean**	30.4 %
Tomato	27.1 %
Broad bean	16.3 %
Pea	9.2 %
French bean	7.5 %
Aubergine	3.2 %
Squash	2.6 %
Pepper	2.0 %
Sweetcorn	1.6 %
Chilli pepper	0.2 %
Root vegetables	
***Onion**	32.3 %
Carrot	19.5 %
Beetroot	17.1 %
Leek	9.9 %
Parsnip	7.8 %
Shallot	4.8 %
Fennel	2.8 %
Radish	1.4 %
Celery	1.1 %
Spring onion	1.1 %
Celeriac	1.0 %
Turnip	0.6 %
Salsify	0.4 %
Garlic	0.2 %

Domestic fruit	
***Apple**	32.4 %
Raspberry	14.7 %
Pear	10.5 %
***Rhubarb**	9.1 %
Strawberry	8.3 %
Plum	6.0 %
Blackcurrant	5.2 %
Loganberry	2.8 %
Gooseberry	2.3 %
Tayberry	1.6 %
Damson	1.1 %
Quince	1.1 %
Melon	0.9 %
Walnut	0.8 %
Redcurrant	0.6 %
Peach	0.4 %
Fig	0.4 %
Orange	0.4 %
Whitecurrant	0.4 %
Blackberry	0.4 %
Greengage	0.4 %
Cherry	0.1 %
Lemon	0.03 %
Milk	
***Milk**	95.2 %
Cheese	4.1 %
Cream	0.7 %
Poultry	
Pheasant	78.3 %
Duck	14.4 %
Chicken	3.8 %
Pigeon	3.6 %
Eggs	
Chicken egg	77.7 %
Duck egg	21.9 %
Pheasant egg	0.3 %

Wild/free foods	
***Blackberry**	69.3 %
Sloe	21.2 %
Mulberry	6.3 %
Damson	2.3 %
Almond	0.3 %
Hazel nut	0.3 %
Bullus plum	0.2 %
Rabbits/hares	
Rabbit	100.0 %
Freshwater fish	
Rainbow trout	50.0 %
Brown trout	50.0 %

Notes

Food types asterisked and emboldened were monitored by FSA in 2005 (EA, EHS, FSA and SEPA, 2006).
Other foods monitored were potato and wheat.
Percentages are based on the consumption of all adults in the survey consuming that particular food group.

Table 50. Occupancy rates in the Hinkley Point direct radiation survey area for adults and children (h/y)

Observation Number	Age (in years)	Distance from site perimeter fence (km)	Indoor occupancy	Outdoor occupancy	Total occupancy
0 to 0.25 km zone					
42	51	[redacted]		1456	1456
260	U	0.10		365	365
232	26	0.10		300	300
21	U	0.10		180	180
22	U	0.10		180	180
23	U	0.10		180	180
229	60	0.10		100	100
212	40	0.10		60	60
19	62	0.10		50	50
296	67	0.10		28	28
>0.5 to 1 km zone					
270	36	0.90	8188	260	8448
146	51	1.00	4675	3285	7960
155	51	1.00	6852	468	7320
153	68	1.00	5600	1709	7309
154	68	1.00	5600	1709	7309
157	17	1.00	6496	368	6864
271	14	0.90	6150	520	6670
272	12	0.90	6150	520	6670
269	38	0.90	6052	260	6312
156	53	1.00	5296	368	5664
273	U	0.90	1040	208	1248
274	U	0.90	1144	104	1248
290	49	0.90		2	2
291	31	0.90		2	2
292	5	0.90		2	2
293	3	0.90		2	2

Notes
No one was identified spending time in the >0.25 to 0.5 km zone
U = Unknown

Table 51. Analysis of occupancy rates in the Hinkley Point direct radiation survey area for adults and children

0 to 0.25 km zone	
Number of hours per year	Number of observations
8000 to 8760	0
7000 to 8000	0
6000 to 7000	0
5000 to 6000	0
4000 to 5000	0
3000 to 4000	0
2000 to 3000	0
1000 to 2000	1
0 to 1000	9
0 to 8760	10

>0.5 to 1 km zone	
Number of hours per year	Number of observations
8000 to 8760	1
7000 to 8000	4
6000 to 7000	4
5000 to 6000	1
4000 to 5000	0
3000 to 4000	0
2000 to 3000	0
1000 to 2000	2
0 to 1000	4
0 to 8760	16

Notes
No one was identified spending time in the >0.25 to 0.5 km zone

Table 52. Gamma dose rate measurements for the Hinkley Point direct radiation survey (µGy/h)

Location	Distance (km)	NGR	Outdoor substrate	Gamma dose rate at 1 metre	Indoor substrate	Gamma dose rate at 1 metre
House 1	1.0	[redacted]	Grass	0.073	Concrete	0.065
House 2	0.9		Grass	0.071	Concrete	0.061
Caravan at house 2	0.9				Caravan	0.056
Background 1	18.0	ST 030 434	Grass	0.090		
Background 2	16.0	ST 033 434	Grass	0.088		
Background 3	8.0	ST 264 394	Grass	0.072		
Background 4	6.0	ST 224 409	Grass	0.097		

Table 53. Examples of food groups eaten and external exposure combinations by adults for consideration for dose assessment puposes

Outdoor occupancy within 1 km of site perimeter fence				*				*				*						
Indoor occupancy within 1 km of site perimeter fence								*										
Occupancy on water									*		*		*	*		*		
Occupancy in water													*					
Handling sediment									*	*						*		
Handling fishing gear																	*	
Intertidal occupancy for boat dwelling over mud														*				
Intertidal occupancy over sand and stones										*		*						
Intertidal occupancy over sand											*							
Intertidal occupancy over salt marsh																*		
Intertidal occupancy over rock																		
Intertidal occupancy over mud, sand and stones												*						
Intertidal occupancy over mud and sand						*				*			*			*		
Intertidal occupancy over mud									*	*						*	*	
Freshwater fish							*											
Venison		*		*														
Wild fungi				*	*										*			*
Honey			*	*											*			
Rabbits/hares	*			*			*								*			*
Wild/free foods	*				*										*			
Eggs							*	*							*			
Poultry	*		*	*	*	*	*								*			*
Sheep meat	*				*													*
Pig meat			*															
Cattle meat	*			*	*	*									*			
Milk		*													*			*
Domestic fruit			*				*	*							*			*
Potato			*				*	*							*		*	*
Root vegetables			*				*	*							*		*	*
Other vegetables			*				*	*							*		*	*
Green vegetables							*	*							*			*
Salt marsh grazed sheep																		
Marine plants/algae																	*	
Wildfowl																*		
Molluscs																	*	
Crustaceans															*		*	*
Fish									*	*		*			*		*	*
Combination number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Table 53. Examples of food groups eaten and external exposure combinations by adults for consideration for dose assessment puposes

Combination number	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy for boat dwelling over mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
19	*																								*							*					
20	*	*																						*									*				
21	*																							*			*										
22																													*								*
23										*		*	*	*		*		*			*																
24								*	*	*		*	*	*				*			*																
25										*		*	*	*				*			*						*										
26											*	*	*					*			*																
27					*	*							*	*				*							*													
28							*	*	*	*	*				*	*	*	*		*	*						*											
29							*	*		*	*						*	*													*							
30							*	*	*	*	*							*												*								
31																													*								*
32	*	*										*														*												
33																	*	*							*												
34							*	*			*		*			*	*	*								*											
35	*																									*	*								*		*
36	*																										*										
37						*																							*								

Notes

The food groups and external exposure pathways marked with an asterisk are combined for the corresponding combination number.

For example, combination number 1 represents an individual (or individuals) from Annex 1 who had positive data in the following pathways; cattle meat, sheep meat, poultry, wild/free foods and rabbits/hares.

Annex 1. Adults' consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over houseboat	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
1	M	43	4.4																1.1																					
2	F	40	4.4																1.1																					
6	M	55	3.5													12.5		**7.1**	1.4		0.5	0.6																		
7	F	47	3.5													12.5		**7.1**	1.4		0.5	0.6																		
8	F	22	3.5													12.5		**7.1**	1.4		0.5	0.6																		
9	F	23	3.5													12.5		**7.1**	1.4		0.5	0.6																		
10	F	50	4.8												**138.3**										1.7															
11	M	61	4.8												**138.3**										1.7															
12	M	19	4.8												**138.3**										1.7															
13	M	U	4.8															**5.7**			0.8																			
14	M	U	4.8															**5.7**			0.8																			
15	F	U	4.8															**5.7**			0.8																			
16	F	U	4.8															**5.7**			0.8																			
17	M	70	4.8								7.5	10.0	10.0	**35.0**			**27.5**		**14.4**				**3.8**																		
18	F	72	4.8								7.5	10.0	10.0	**35.0**			**27.5**		**14.4**				**3.8**																		
19	M	62	2.4													**47.3**			**8.5**			**2.5**	**2.7**	0.5	**10.0**															50
20	F	60	2.4													**47.3**			**8.5**			**2.5**	**2.7**	0.5	**10.0**															
21	M	U	U																																					180
22	M	U	U																																					180
23	M	U	U																																					180
24	M	56	5.0													**47.3**		**5.7**																						
25	F	57	5.0													**47.3**		**5.7**																						
26	M	U	5.0													**37.8**		**11.3**	0.7		1.5			0.5																
27	F	U	5.0													**37.8**		**11.3**	0.7		1.5			0.5																
28	M	U	2.0													**37.8**		**11.3**	0.7																					
29	F	U	2.0													**37.8**		**11.3**	0.7																					
30	M	U	6.0													**60.0**			**5.4**																					
31	F	U	6.0													**60.0**			**5.4**									10												
32	M	56	3.0							9.8	23.1	**56.4**	**36.4**	10.7						2.9																				

Annex 1. Adults' consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over houseboat	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
33	F	51	3.0							9.8	23.1	**56.4**	**36.4**	10.7						2.9																				
34	M	61	3.0							14.9	12.0	12.6	27.3	0.9					2.0	**14.3**		**0.9**				**1.2**															
35	F	43	3.0							14.9	12.0	12.6	27.3	0.9						**14.3**		**0.9**				**1.2**													
36	F	25	3.0							14.9	12.0	12.6	27.3	0.9						**14.3**		**0.9**				**1.2**													
37	M	20	3.0							14.9	12.0	12.6	27.3	0.9						**14.3**		**0.9**				**1.2**													
38	M	70	3.0							12.9	15.5	10.7	6.8	0.8																									
39	F	21	U							12.9	15.5	10.7	6.8	0.8																									
40	F	U	U							12.9	15.5	10.7	6.8	0.8																									
41	F	U	U							12.9	15.5	10.7	6.8	0.8																									
42	M	51	[redacted]																	**14.1**																			1456
43	F	49	2.5																	**14.1**																			
44	M	U	10.5																																		400		
45	M	U	U	2.3																							10									10	100		
46	M	U	U	17.6																								**1200**												
47	M	53	U																													20							
49	M	43	U																									100											
50	F	42	U																									100											
51	M	U	U																																		230		
52	M	U	U																																		230		
53	M	U	U																																		230		
54	M	U	U																																		230		
55	M	U	U																																		230		
56	M	U	U																																		230		
57	M	U	U																																		230		
58	M	U	U																																		230		
59	M	U	U																																		230		
60	M	U	U																																		230		
61	M	U	U																																		230		
62	M	U	U																																		230		

Annex 1. Adults' consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over houseboat	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
63	M	U	U																																			230		
64	M	U	U																																			230		
65	M	U	U																																			230		
66	M	U	U																													**840**								
67	M	U	U																													170								
68	M	U	U																													170								
69	M	U	U																													170								
70	M	U	U																													150								
71	M	U	U																													150								
72	F	U	U																													150								
73	F	U	U																													150								
74	M	U	U	2.3																								150								20				
75	M	U	U	2.3																								150								20				
76	F	U	U																									50												
77	F	U	U																									50												
78	F	U	U																									50												
79	F	U	U																									50												
83	F	U	U																														40							
87	F	60	U																														100							
88	M	U	3.0							12.3	22.3	13.6	21.8	2.1						**12.3**																				
89	F	U	3.0							12.3	22.3	13.6	21.8	2.1						**12.3**																				
90	F	U	U							2.0	3.7	2.3	3.6	0.3																										
91	M	U	U							2.0	3.7	2.3	3.6	0.3																										
92	M	18	U							2.0	3.7	2.3	3.6	0.3																										
94	F	46	U																													130								
95	M	U	U																																		60		
96	F	U	U																																		60		
98	M	U	U	5.4																																	400		
99	F	U	U	5.4																																	400		
100	M	U	U																																		480		

Annex 1. Adults' consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over houseboat	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
101	M	U	U																																		260		
102	M	U	U																																			420		
103	M	U	U	2.5																																		530		
104	M	U	U																								400									10	260		
105	F	62	14.0																															**2066**				3099		
106	F	U	3.0											2.7		13.6					0.5		**3.6**																	
107	M	U	3.0											2.7		13.6					0.5		0.9																	
108	M	U	3.0													11.3																								
109	M	U	3.0													11.3																								
110	M	U	3.0													11.3																								
111	M	U	3.0													11.3																								
112	F	U	3.0													11.3																								
113	F	U	3.0													11.3																								
114	M	U	6.0				**9.7**																				10	**520**			40					50		240		
115	F	U	6.0				**3.2**																					400												
116	M	U	U																								200												
117	M	U	U																								200												
118	M	U	U																								200												
119	M	U	U																								200												
120	M	U	U																								200												
121	M	61	U																												52								
122	F	69	U																												52								
123	M	72	1.6	**44.2**	**15.3**	**1.9**		**2.2**			20.5	20.4	**81.9**														**1560**								**1560**				
124	F	72	1.6	**44.2**	**6.1**						20.5	20.4	**81.9**																										
125	M	45	U	**44.2**	**15.3**	**1.9**		**1.8**																			**1560**								**1560**				
126	M	40	U	11.8	1.5																						780								**780**				
127	F	40	U	11.8	1.5																																		
131	F	U	U	11.8	1.5																																		
132	F	U	U	11.8	1.5																																		
133	F	U	U	11.8	1.5																																		
134	F	U	U	11.8	1.5																																		

Annex 1. Adults' consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over houseboat	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
135	F	U	U	11.8	1.5																																			
136	M	U	U	11.8	1.5																																			
137	M	U	U	11.8	1.5																																			
138	M	U	U	11.8	1.5																																			
139	M	U	U	11.8	1.5																																			
140	M	U	U	11.8	1.5																																			
141	M	51	5.8																												**520**								
142	M	63	5.6						**20.0**																						153								
143	F	63	5.6						**20.0**																														
144	M	55	2.1	2.7							11.3	11.3	**50.8**		**207.4**																								
145	F	55	2.1	2.7							11.3	11.3	**50.8**																										
146	F	51	1.0							8.0	**30.8**									**26.7**																		4675	3285
147	F	50	1.3	2.7						1.1	6.8																												
148	F	55	1.3	2.7						1.1	6.8																												
149	M	74	1.3							**29.8**	11.3	**47.0**	**82.6**	**40.4**																								
150	F	73	1.3							**29.8**	11.3	**22.4**	**82.6**	**40.4**																								
151	M	U	U									**22.4**	**82.6**																									
152	F	U	U									**22.4**	**82.6**																									
153	M	68	1.1							**32.1**	**92.2**	13.2	30.3	9.3						8.9																	5600	1709
154	F	68	1.1							**32.1**	**92.2**	13.2	30.3	9.3						8.9																	5600	1709
155	F	51	1.0							6.4		3.7																									6852	468
156	M	53	1.0							6.4		3.7																									5296	368
157	F	17	1.0							6.4		3.7																									6496	368
158	M	53	1.5	1.3						5.1	6.8		6.8							8.9																		
159	F	49	1.5	1.3						5.1	6.8		6.8							8.9																		
160	F	52	1.6							8.5	10.8			**28.6**																								
161	M	54	1.6							8.5	10.8			**28.6**																								
162	F	51	1.5	2.7																**35.3**																		
163	M	52	1.5	2.7																**35.3**																		
164	F	55	3.3							**34.6**	12.2	10.5	12.6	**64.8**						8.9	**4.5**																		
165	M	55	3.3							**34.6**	12.2	10.5	12.6	**64.8**						8.9	**4.5**																		

Annex 1. Adults' consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over houseboat	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
166	F	28	U							17.8	6.1	5.3	6.3	**31.4**																										
167	F	29	U							17.8	6.1	5.3	6.3	**31.4**																										
168	M	29	U							17.8	6.1	5.3	6.3	**31.4**																										
169	M	30	U							17.8	6.1	5.3	6.3	**31.4**																										
170	M	35	U	**41.9**																								210								210				
171	M	U	U	**41.9**																																				
172	F	37	U	14.0																								126								126				
173	U	U	U	14.0																																				
174	U	U	U	14.0																																				
175	U	U	U	14.0																																				
176	U	U	U	14.0																																				
177	U	U	U	14.0																																				
178	M	45	U																													**350**							
179	F	45	U																													**350**							
180	M	42	U	**59.0**																								**1515**							**1515**				
181	F	39	U	**35.4**																																				
182	M	U	U	**68.9**																								**1515**							**1515**				
183	M	46	U	6.8																								60												
184	F	46	U	6.8																																				
185	F	19	U	3.4																																				
186	M	45	U	**23.6**																																		1120		
188	M	49	U	8.2																																		1560		
189	F	49	U	8.2																																				
190	M	35	U																													100					100		
191	M	35	U																													100					100		
192	M	35	U																													100					100		
193	M	64	U	3.6																																				
194	F	63	U	3.6																																				
195	M	75	U	**23.6**	1.6																						368									436		68		
196	M	U	U	**23.6**	1.6																																			
199	M	46	U	0.5																																				

Annex 1. Adults' consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over houseboat	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
200	F	46	U	0.5																																			
202	M	41	U	10.0																													**672**							
203	F	41	U	10.0																																				
205	M	70	3.4							**51.5**	**72.4**	**32.4**	**54.6**	**72.5**																										
206	F	59	2.8							12.8	15.9	6.8	22.7	23.4					2.7	**23.7**	**3.5**	0.5																	
207	F	80	2.8							12.8	15.9	6.8	22.7	23.4					2.7	**23.7**	**3.5**	0.5																	
208	M	75	1.2							5.0		6.9	25.4	6.8						8.9																		
209	F	75	1.2							5.0		6.9	25.4	6.8						8.9																		
210	F	46	U																											**100**								
211	F	39	U																											**100**								
212	M	40	U																													60							60
213	M	U	4.7												**198.9**				0.5		0.5			0.2														
214	F	U	4.7												**198.9**				0.5		0.5			0.2														
215	M	U	4.7												**207.4**																							
216	F	U	4.7												**207.4**																							
218	M	62	3.6								18.2	4.5	**62.5**		**87.5**	**28.6**	**17.1**				0.3			0.2														
219	F	60	3.6								18.2	4.5	**62.5**		**87.5**	**28.6**	**17.1**				0.3			0.2														
220	M	36	3.6										**62.5**		**87.5**	**28.6**	**17.1**				0.3			0.2					4								
221	F	32	3.6										**62.5**		**87.5**	**28.6**	**17.1**				0.3			0.2					4								
224	M	28	3.6										**62.5**		**87.5**	**28.6**	**17.1**		1.4		0.3			0.2													
225	F	30	3.6										**62.5**		**87.5**	**28.6**	**17.1**		1.4		0.3			0.2													
226	M	U	3.3	2.6	0.3					**45.8**	**53.5**	**26.3**	**38.7**	**61.4**	36.2			**15.1**	4.5			0.8		**2.3**													
227	F	U	3.3	2.6	0.3					**45.8**	**39.0**	**26.3**	**38.7**	**61.4**	36.2			**15.1**	4.5			0.8		**2.3**													
228	F	U	3.3	2.6	0.3					**45.8**	**44.4**	**26.3**	**38.7**	**61.8**	36.2			**15.1**	4.5			0.8		**2.3**													
229	M	60	25.0											4.0	**146.0**	18.9					**6.7**			0.7														100
230	F	53	25.0											4.0	**146.0**	18.9					**6.7**			0.7													
231	F	24	25.0											4.0	**146.0**	18.9					**6.7**																
232	M	26	2.5												**146.0**	18.9																						300
233	F	23	2.5												**146.0**	18.9																						
234	M	74	4.3						2.8							18.9	**25.3**																					
235	F	68	4.3						2.8							18.9	**25.3**																					

Annex 1. Adults' consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over houseboat	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
236	M	33	4.3						2.8						**121.5**	18.9	**25.3**																							
237	M	18	4.3						2.8						**121.5**	18.9	**25.3**																							
238	M	U	3.0				0.3		3.8							18.9	**14.5**				**2.9**																			
239	F	U	3.0				0.3		3.8							18.9	**14.5**				**2.9**																			
240	F	30	3.0				0.3		3.8							18.9	**14.5**				0.7							156												
241	M	28	U				0.3										**14.5**																							
242	F	27	U				0.3										**14.5**																							
243	F	33	U				0.3										**14.5**																							
244	M	U	U				0.3										**14.5**																							
245	F	56	4.6							**80.6**	**89.6**	**63.1**	**39.2**	**53.2**				2.8	1.4	**17.8**	2.0		0.5	**0.9**					**104**											
246	M	56	4.6							**80.6**	**89.6**	**63.1**	**39.2**	**53.2**				2.8	1.4	**17.8**	2.0		0.5	**0.9**					**104**											
247	F	41	4.6							1.5	16.3	7.2	6.3	1.8							1.1								15											
248	M	42	4.6							1.5	16.3	7.2	6.3	1.8							1.1								15											
251	M	41	4.7							6.0	22.2		8.7	9.3						11.1	1.4											10							
252	M	43	4.7							6.0	22.2		8.7	9.3						11.1	1.4											10							
256	M	62	4.9							4.5	20.0	18.8	**34.1**	12.1							0.7																		
257	F	43	4.9							4.5	20.0	18.8	**34.1**	12.1							0.7													35						
258	F	72	4.9							4.5	20.0	18.8	**34.1**	12.1							0.7																			
260	M	U	3.3																												**243**								365
261	M	72	4.7							9.8	8.3	7.9	**42.3**	16.4				**5.7**	2.3	0.2	**3.8**		0.2						4											
262	F	U	4.7							9.8	8.3	7.9	**42.3**	16.4				**5.7**	2.3	0.2	**3.8**		0.2						4											
263	F	19	4.7							9.8	8.3	7.9	**42.3**	16.4				**5.7**	2.3	0.2	**3.8**		0.2						4											
264	M	22	4.7							9.8	8.3	7.9	**42.3**	16.4				**5.7**	2.3	0.2	**3.8**		0.2						4											
265	F	U	8.0							9.8	8.3	7.9	**42.3**	16.4				**5.7**	2.3	0.2	**3.8**																			
266	F	U	8.0							9.8	8.3	7.9	**42.3**	16.4				**5.7**	2.3	0.2	**3.8**																			
267	F	43	U																				**5.9**																	

Annex 1. Adults' consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over houseboat	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
268	M	17	U																				**5.9**																
269	M	38	0.9							1.4	5.9	18.7	20.5																									6052	260
270	F	36	0.9							1.4	5.9	18.7	20.5																									8188	260
273	M	U	0.9																																			1040	208
274	F	U	0.9																																			1144	104
275	M	55	U	**23.8**																							30			30									
276	M	41	U																								30			30									
277	F	50	8.0	1.8	0.2										27.0														**130**										
278	F	50	U																	2.1	1.2							26											
279	M	58	5.0	1.4	0.5					26.3	24.3	**21.5**	**100.0**	**33.3**	**126.5**	**47.3**			**5.7**	5.2	**4.5**	**1.4**	**2.7**	**1.8**																
280	F	80	5.0	1.4	0.5					26.3	24.3	**21.5**	**100.0**	**33.3**	**104.0**	**47.3**			**5.7**	5.2	**4.5**	**1.4**	**2.7**	**1.8**																
281	F	61	5.0							26.3	24.3	**21.5**	**100.0**	**33.3**		**47.3**																							
282	M	70	5.0							26.3	24.3	**21.5**	**100.0**	**33.3**		**47.3**																							
283	F	U	4.2							5.7	14.7			11.3		**23.6**			0.5	7.9	**3.5**								**104**										
284	M	U	4.2							5.7	14.7			11.3		**23.6**				7.9	**3.5**																		
285	F	U	4.2							5.7	14.7			11.3		**23.6**				7.9	**3.5**																		
286	M	50	12.0	**40.1**																																	600		
287	F	50	12.0	**40.1**																																			
288	M	29	11.0																										6										
289	F	27	11.0																										12										
290	M	49	6.0	5.3																									12				72						2
291	F	31	6.0																										12										2
294	M	40	U																										**182**										
296	M	67	7.0	2.5																									48	28							24		28
297	F	69	7.0	2.5																									48										
298	M	69	U	3.4																										**65**		65							
299	M	44	U	3.4																										**65**		65							
300	F	68	U	3.4																										**65**		65							
301	M	46	U	**39.5**																							10	10					80			10			

Annex 1. Adults' consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over houseboat	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
302	M	U	U																								10	10					80			10				
303	M	U	U																								10	10					80			10				
304	M	U	U																								10	10					80			10				
305	M	U	U																								10	10					80			10				
306	F	U	U																								10	10					80			10				
307	M	43	14.0																														**5046**				2522		
308	F	31	14.0																														**5046**				2522		
309	M	48	14.0																														**2808**				2808		
310	M	35	U	5.3																										48										
311	F	35	U	5.3																																					
314	M	U	U																										13											
315	F	U	U																										13											
316	M	U	U																										12											
317	F	U	U																										12											
321	M	U	U																										6											
322	M	U	U																										6											
323	F	U	U																										6											
324	F	U	U																										6											
327	M	U	U																											6										
328	F	U	U																											6										
331	M	U	U																										2											
332	F	U	U																										2											
333	M	U	U																														160				40			
334	F	U	U																														160				40			
338	M	U	U																														**546**							
339	M	U	U																														**546**							
340	M	U	U																														**546**							
341	M	U	U																														**390**							
342	M	U	U																														**390**							

Annex 1. Adults' consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over houseboat	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
343	M	U	U																											9		9									
344	M	U	U																											9		9									
345	M	U	U																											9		9									
346	M	U	U																											9		9									
347	M	U	U																											9		9									
348	M	U	U																											9		9									
349	M	U	U																													5									
350	M	32	U																									**1092**								**780**		144		
351	F	U	12.0																				0.5																	
352	F	U	2.0																	**11.9**																				
353	M	U	2.0																	**11.9**																				
354	M	U	U																													**641**								
355	M	U	U																													**641**								
356	M	U	U																													**641**								
357	M	U	U																													**641**								
358	M	U	3.4																																		420		

Notes
Emboldened observations are included in the critical groups.
U = Unknown

Annex 2. Children's consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Poultry	Eggs	Wild/free foods	Wild fungi	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
15 year old age group																								
197	F	16	U		**1.6**																			
93	F	15	U			**2.0**	**3.7**	2.3	3.6	**0.3**														
187	M	15	U	**23.6**																				
198	F	15	U		**1.6**																			
3	F	14	4.4											**1.1**										
201	M	14	U	0.5																				
271	F	14	0.9			**1.4**	**5.9**	**18.7**	**20.5**														6150	520
337	M	14	U																	160		40		
84	F	13	U																		40			
80	F	12	U																	30				
82	M	12	U																	30				
130	U	12	U	**11.8**	**1.5**																			
272	M	12	0.9			**1.4**	**5.9**	**18.7**	**20.5**														6150	520
336	M	12	U																	160		40		

Annex 2. Children's consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Poultry	Eggs	Wild/free foods	Wild fungi	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
10 year old age group																								
4	M	11	4.4											**1.1**										
81	M	11	U																	30				
129	U	11	U	**11.8**	**1.5**																			
249	M	11	4.6			1.5	**16.3**	**7.2**	6.3	1.8						**0.6**		15						
253	M	11	4.7			**6.0**	**22.2**		8.7	**9.3**					**11.1**	**1.4**				10				
97	M	10	U																			60		
128	U	10	U	**11.8**	**1.5**																			
295	M	10	U															**182**						
5	F	9	4.4											**1.1**										
85	F	9	U																		40			
204	M	9	U	**10.0**																				
250	F	9	4.6			1.5	**16.3**	**7.2**	6.3	1.8						**0.6**		15						
254	F	9	4.7			**6.0**	**22.2**		8.7	**9.3**					**11.1**	**1.4**				10				
259	M	9	4.9			**4.5**	**20.0**	**18.8**	**34.1**	**12.1**						**0.7**					35			
335	F	9	U																	160		40		
329	F	8	U																6					
86	M	7	U																		40			
222	M	7	3.6						**62.5**		**87.5**	**14.3**	**8.6**			0.3	**0.2**	4						
318	M	7	U															12						

Annex 2. Children's consumption rates (kg/y or l/y) and occupancy rates (h/y) in the Hinkley Point area

Observation number	Sex	Age in years	Distance of residence from site (km)	Fish	Crustaceans	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Poultry	Eggs	Wild/free foods	Wild fungi	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Occupancy on water	Indoor occupancy within 1 km of site perimeter fence	Outdoor occupancy within 1 km of site perimeter fence
5 year old age group																								
48	M	6	U																	20				
255	M	6	4.7			**6.0**	**22.2**		8.7	**9.3**					**11.1**	**1.4**				10				
330	F	6	U																6					
223	F	5	3.6						**62.5**		**87.5**	**14.3**	**8.6**			0.3	**0.2**	4						
292	F	5	6.0															12						2
319	M	5	U															12						
312	F	4	U	**2.6**																				
217	M	3	4.7								**207.4**													
293	F	3	6.0															12						2
320	F	3	U															12						
325	F	3	U															6						
1 year old age group																								
313	F	1	U	**2.6**																				
326	M	1	U															6						

Notes

Emboldened observations are included in the critical groups.

U = Unknown

Annex 3. Qualitative and estimated data for use in dose assessment

	Details of activity	Exposure pathways involved	Estimated rate
1	Elver fishing on the River Parrett	Occupancy over mud	Experience from other habits surveys suggest rates are unlikely to exceed 200 hours per year

Annex 4. Ratios for determining consumption and occupancy rates for children

Group	Ratio child/adult[1]	
	1 yr old	10 yr old
Fish[2]	0.050	0.200
Crustaceans[2]	0.050	0.250
Molluscs[2]	0.050	0.250
Green vegetables	0.222	0.444
Other vegetables	0.200	0.500
Root vegetables	0.375	0.500
Potatoes	0.292	0.708
Domestic fruit	0.467	0.667
Milk	1.333	1.000
Cattle meat	0.222	0.667
Pig meat	0.138	0.625
Sheep meat	0.120	0.400
Poultry	0.183	0.500
Eggs	0.600	0.800
Wild/free foods[3]	0.110	0.490
Game[4]	0.140	0.500
Honey	0.789	0.789
Wild fungi	0.150	0.450
Freshwater fish[2]	0.050	0.250
Direct radiation	1.000	1.000
External exposure	0.500	0.030
Plume	1.000	1.000

Notes

1. The age groups suggested for assessment in this table are those relating to dose coefficients representing 1 to 2 yr olds (labelled 1 yr old) and 7 to 12 yr olds (labelled 10 yr old). Excepting notes 2 and 3, ratios were derived from Byrom et al., (1995) for 1yr old (6 - 12 months) and 10 yr old children (10 - 11 yrs).
2. Ratios were derived from Smith and Jones, (2003) which presented data for infants and children.
3. Ratios were derived from FSA data for wild fruit and nuts for infants and 10 yr old children.
4. Game includes rabbits/hares and venison.

Annex 5. Summary of adults' profiled habits data in the Hinkley Point area

Profile Name	Number of individuals	Pathway Name	Crustacea	Direct[1]	Eggs	Fish - Freshwater	Fish - Sea	Fruit - Domestic	Fruit and Nuts - Wild	Gamma Ext - Houseboat	Gamma ext - Sediment[2]	Honey	Marine plants/algae	Meat - Cattle	Meat - Game[3]	Meat - Pig	Meat - Poultry	Meat - Sheep	Milk	Mollusca	Mushrooms	Occupancy in water	Occupancy on water	Plume (IN; 0-0.25km)[4]	Plume (MID; 0.25-0.5km)[4]	Plume (OUT; 0.5-1km)[4]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
			kg	-	kg	kg	kg	kg	kg	h	h	kg	kg	kg	kg	kg	kg	kg	l	kg	kg	h	h	h	h	h	kg	kg	kg	kg
Crustacean consumers	3		12.2				44.2				1040		1.3							1.3								13.7	54.6	13.6
Occupants for direct radiation	47			1	2.9		0.3	1.1	0.3		20	0.1		4.3	0.6		0.4		14.6		0.1			141		2984	4.7	11.3	5.1	3.7
Egg consumers	17			0.1	18.5	0.3	0.3	9.5	0.7		10	0.1			0.3		0.6	0.3			0.1			85.6		468	16.4	19.7	16.3	12.8
Freshwater fish consumers	4				14.3	1.2		0.9							0.9		0.5										14.9	12.0	27.3	12.6
Sea fish consumers	15		2.7				39.6				460		0.3							0.3			120					2.7	10.9	2.7
Domestic fruit consumers	22		0.1		2.9		0.5	43.6	1.0		10	0.6		8.6	0.2	2.5	2.6	2.3	15.4		0.6						30.6	27.0	40.2	20.7
Wild fruit and nut consumers	20			0.1	5.0		0.1	19.4	4.2		10	0.3		13.0	0.2	1.4	1.5	1.7	33.4		0.2			5			11.1	9.9	26.2	6.3
Occupants for exposure - Houseboat	4									3740													2740							
Occupants for exposure - Sediment	18		1.8				14.2				890		0.2		0.5					0.2			20					1.1	4.6	1.1
Honey consumers	9		0.1	0.1	1.2		0.3	15.5	1.1			3.8		22.5	3.1	6.1	6.3		25.6		0.5			5.6			5.9	7.1	24.4	7.0
Marine plants/algae consumers	2		15.3				44.2				1560		2.0							1.9								10.2	41.0	10.2
Cattle meat consumers	23				1.5		0.1	7.3	1.0		10	0.5		38.8	1.2	4.5	2.0	2.5	32.8		0.3			2			5.3	7.7	33.7	4.1
Game meat consumers	3			0.3							190	1.8		31.5	11.6		5.7				0.3		80	16.7						
Pig meat consumers	19							3.7	0.4		10	0.4		16.0	0.1	19.0	1.7		40.4		0.1							2.7	20.8	1.5
Poultry meat consumers	8		0.1	0.1	1.3		0.3	17.1	1.1			2.3		38.7	3.5	6.9	8.5		28.8		0.6			6.3			6.6	7.9	27.5	7.9
Sheep meat consumers	23				0.1		0.3	12.3	1.3					12.9	0.2		1.5	8.1	4.7		0.3						8.5	8.1	16.1	5.5
Milk consumers	23			0.1	0.5		0.2	3.4	1.4			0.2		17.3	0.3	6.7	0.6		137.5		0.3			17.4			2.3	4.2	27.2	2.8
Mollusc consumers	2		15.3				44.2				1560		2.0							1.9								10.2	41.0	10.2
Mushroom consumers	7		0.3		6.6		1.5	51.1	1.9		30	0.9		13.5	0.7		3.9	7.3	48.5		1.7						50.2	52.1	56.3	35.4
Occupants in water	1										400											10	260							
Occupants on water	6						5.3			2490													2270							
Occupants for plume pathways (inner area)	6			1	2.4						40			3.2					24.3					444						
Occupants for plume pathways (middle area)	7																								0					
Occupants for plume pathways (outer area)	17			1	5.6			2.3																		7148	11.8	28.4	12.7	9.4
Green vegetable consumers	12		0.1	0.2	5.9		0.7	49.4	1.1		20	0.1			0.2		1.4	4.2	9.1		0.7					1218	45.2	51.7	41.7	29.5
Other domestic vegetable consumers	9		0.1	0.3	8.9		0.9	42.5	0.5		20	0.1			0.3		1.8	5.7	12.1		1.0					2509	46.9	67.1	34.4	29.3
Potato consumers	35		0.7		1.5		3.0	21.0	1.1		50	0.2	0.1	10.3	0.1	2.9	1.2	2.4	30.6	0.1	0.4						17.3	21.8	58.5	20.8
Root vegetable consumers	16		0.1		3.2		0.7	37.4	0.8		10	0.4		11.8	0.3		1.7	3.2	21.2		0.8						33.4	34.7	65.7	34.4

Notes

1. Expressed as a proportion of the group who are present within 1km of site
2. Gamma ext - Sediment includes occupancy over mud, mud & sand, mud, sand & stones, salt marsh, sand, and sand & stones
3. Game meat includes rabbits/hares, venison and wildfowl
4. Plume times are the sums of individuals' indoor and outdoor times

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