

Release to sewer - Assessment Details

Version 8 May 2015

Name of premises **Norges miljø- og biovitenskapelige universitet**

Reference

Where does effluent discharge from STW go?:

To a brook? **no**

To a river direct from STW or via a brook? **no**

To estuary/coast direct from STW or via a brook or river? **yes**

Data entry:

Average brook flow rate **m³/s**

Average river flow rate **m³/s**

Sewage works **User defined (enter value in cell E25)**

Average raw sewage flow rate **7255 m³/day 7255**

Coastal Location **User defined (enter value in cell E29)**

Average coastal/estuary exchange rate **3 m³/s 2.8**

Population group

| Population group | Total dose | Food Dose |
|---|--------------------------|--------------------------|
| STW worker dose at STW | 0.00 $\mu\text{Sv/y}$ | |
| Farming family dose (sewage sludge to land) | 0.00 $\mu\text{Sv/y}$ | 0.0E+00 $\mu\text{Sv/y}$ |
| Child playing in brook | #DIV/0! $\mu\text{Sv/y}$ | |
| Angler dose (river) | #DIV/0! $\mu\text{Sv/y}$ | #DIV/0! $\mu\text{Sv/y}$ |
| Irrigated food consumer dose (river water) | #DIV/0! $\mu\text{Sv/y}$ | #DIV/0! $\mu\text{Sv/y}$ |
| Fisherman dose (estuary/coastal) | 0.00 $\mu\text{Sv/y}$ | 3.0E-05 $\mu\text{Sv/y}$ |

Worst #DIV/0! $\mu\text{Sv/y}$ #DIV/0! $\mu\text{Sv/y}$

FSA consultation required for non-nuclear permit? #DIV/0!

Wildlife Group

| | |
|-----------------------------------|--------------------------|
| River wildlife - Worst affected | #DIV/0! $\mu\text{Gy/h}$ |
| Estuary wildlife - Worst affected | 0.00 $\mu\text{Gy/h}$ |

Name Signature Date

Assessed by **Heidi Randem** 17.02.2023

Reviewed by

| Combo box selection #1 | Yes |
|------------------------|-----|
| Combo box selection #2 | No |
| Brook factor | 0 |
| River factor | 0 |
| Estuary factor | 1 |

Kommentarer NMBU:

Betydning av formuleringer:

STW = Sewage Treatment Works = Renseanlegg

Estuary = Elvemunning

Effluent = Avløp, utslipp

Sewage flow rate: Basert på tall fra Sandre Follo rensesanlegg, 6166536 m³ totalt i perioden 1 jan 2019-30 april 2021 (28 mnd).

Average exchange rate: Denne er ukjent - tallet er kun basert på gjetning (gittatt lite utløp sammenliknet med tallene i arkket Coastal exchange rates), men anses ikke så relevant pga kort halveringstid for Tc-99m.

Om denne filen:

Malen for disse beregningene er laget i England og tilrettelagt for forhold der. Den er benyttet etter beste evne for NMBU. 17.02.23 Heidi Randem

Guidance

1. The spreadsheet is colour coded as follows:

| | |
|---|----------------------------------|
| | Row and column headings |
| | Data entry by user |
| | Data provided in spreadsheet |
| | Results and interim calculations |

2. Assessment Details - Enter the relevant data on this sheet. You should answer the questions relating to the route of the treated effluent as this will ensure that doses are only calculated for the appropriate population groups. You may enter the average brook flow rate, river flow rate, raw sewage flow rate and estuary/coastal water exchange rate. Default values are provided if the information is not available.

3. Releases to sewer - Enter the limits for each radionuclide on this sheet. You may need to select surrogate radionuclides or use the other alpha and other beta gamma categories.

4. Summary total dose - The results are displayed on this page along with the percentage contribution from each nuclide.

5. STW worker dose, farming family dose, child in brook dose, angler dose, irrig food dose and fisherman dose - The dose contribution from each exposure pathway for these population groups are shown.

Release to Sewer

| Radionuclide | Surrogate radionuclide | | Discharge at Limits | STW partitioning and decay factor |
|-----------------------------|------------------------|----------------------|---------------------|-----------------------------------|
| | Human Assessments | Wildlife assessments | Bq/y | To liquid phase |
| Tritium | - | - | | 0,85 |
| Tritium (Organically Bound) | - | Carbon-14 | | 0,85 |
| Carbon-11 | - | - | | 0,00 |
| Carbon-14 | - | - | | 0,85 |
| Fluorine-18 | Sodium-24 | Technetium-99m | | 0,45 |
| Sodium-22 | - | Caesium-137 | | 0,90 |
| Sodium-24 | - | Caesium-137 | | 0,45 |
| Phosphorus-32 | - | - | | 0,19 |
| Phosphorus-33 | - | Phosphorus-32 | | 0,20 |
| Sulphur-35 | - | - | | 0,89 |
| Chlorine-36 | - | Iodine-129 | | 0,90 |
| Calcium-45 | - | Strontium-90 | | 0,20 |
| Calcium-47 | - | Strontium-90 | | 0,18 |
| Vanadium-48 | - | Caesium-137 | | 0,10 |
| Chromium-51 | - | Cobalt-60 | | 0,10 |
| Manganese-52 | - | Cobalt-60 | | 0,46 |
| Manganese-54 | - | Cobalt-60 | | 0,50 |
| Manganese-56 | Manganese-54 | Technetium-99m | | 0,50 |
| Iron-55 | - | Cobalt-60 | | 0,10 |
| Iron-59 | - | Cobalt-60 | | 0,10 |
| Cobalt-56 | - | Cobalt-60 | | 0,20 |
| Cobalt-57 | - | Cobalt-60 | | 0,20 |
| Cobalt-58 | - | Cobalt-60 | | 0,20 |
| Cobalt-60 | - | - | | 0,20 |
| Nickel-63 | - | Caesium-137 | | 0,50 |
| Zinc-65 | - | Caesium-137 | | 0,50 |
| Gallium-67 | - | Cobalt-60 | | 0,09 |
| Selenium-75 | - | Caesium-137 | | 0,50 |
| Bromine-82 | - | Iodine-131 | | 0,67 |
| Rubidium-82 | Rubidium-83 | Strontium-90 | | 0,20 |
| Rubidium-83 | - | Strontium-90 | | 0,20 |
| Strontium-89 | - | Strontium-90 | | 0,89 |
| Strontium-90 | - | - | | 0,90 |
| Yttrium-90 | - | Strontium-90 | | 0,76 |
| Zirconium-95 | - | Caesium-137 | | 0,10 |
| Niobium-95 | - | Caesium-137 | | 0,49 |
| Molybdenum-99 | - | Iodine-129 | | 0,77 |
| Technetium-99 | - | - | | 0,90 |
| Technetium-99m | - | - | 736000000 | 0,16 |
| Ruthenium-103 | - | Ruthenium-106 | | 0,89 |
| Ruthenium-106 | - | - | | 0,90 |
| Silver-110m | - | Caesium-137 | | 0,10 |
| Indium-111 | - | Ruthenium-106 | | 0,09 |
| Indium-113m | Indium-111 | Ruthenium-106 | | 0,09 |
| Antimony-125 | - | Ruthenium-106 | | 0,20 |
| Iodine-123 | - | Iodine-131 | | 0,36 |
| Iodine-125 | - | - | | 0,79 |
| Iodine-129 | - | - | | 0,80 |
| Iodine-131 | - | - | 0 | 0,76 |
| Iodine-132 | Iodine-133 | Iodine-125 | | 0,48 |
| Iodine-133 | - | Iodine-125 | | 0,48 |

STW worker dose at STW

| Radionuclide | Surrogate radionuclide | Dose per unit release (dpur) | | | | % Contribution |
|-----------------------------|------------------------|------------------------------|------------------------------|------------|-----------------|----------------|
| | | External dose | Inadvertent inh and ing dose | Total dose | Worst age group | |
| | | µSv/y | µSv/y | µSv/y | | |
| Tritium | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Tritium (Organically Bound) | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Carbon-11 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Carbon-14 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Fluorine-18 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Sodium-22 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Sodium-24 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Phosphorus-32 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Phosphorus-33 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Sulphur-35 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Chlorine-36 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Calcium-45 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Calcium-47 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Vanadium-48 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Chromium-51 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Manganese-52 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Manganese-54 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Manganese-56 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Iron-55 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Iron-59 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Cobalt-56 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Cobalt-57 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Cobalt-58 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Cobalt-60 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Nickel-63 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Zinc-65 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Gallium-67 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Selenium-75 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Bromine-82 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Rubidium-82 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Rubidium-83 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Strontium-89 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Strontium-90 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Yttrium-90 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Zirconium-95 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Niobium-95 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Molybdenum-99 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Technetium-99 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Technetium-99m | - | 3.3E-03 | 2.4E-08 | 3.3E-03 | 100.00 % | |
| Ruthenium-103 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |
| Ruthenium-106 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | Adult | |

Summary total doses

| Radionuclide | Surrogate radionuclide | STW worker dose | Farming family dose | Child playing in brook dose | Angler dose | Irrigated food consumer | Fisherman dose | Worst dose | % Contribution | Worst population group |
|-----------------------------|------------------------|-----------------|---------------------|-----------------------------|-------------|-------------------------|----------------|------------|----------------|------------------------|
| | | µSv/y | µSv/y | µSv/y | µSv/y | µSv/y | µSv/y | µSv/y | | |
| Tritium | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Tritium (Organically Bound) | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Carbon-11 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Carbon-14 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Fluorine-18 | Sodium-24 | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Sodium-22 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Sodium-24 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Phosphorus-32 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Phosphorus-33 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Sulphur-35 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Chlorine-36 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Calcium-45 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Calcium-47 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Vanadium-48 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Chromium-51 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Manganese-52 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Manganese-54 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Manganese-56 | Manganese-54 | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Iron-55 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Iron-59 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Cobalt-56 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Cobalt-57 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Cobalt-58 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Cobalt-60 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Nickel-63 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Zinc-65 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Gallium-67 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Selenium-75 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Bromine-82 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Rubidium-82 | Rubidium-83 | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Rubidium-83 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Strontium-89 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Strontium-90 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Yttrium-90 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Zirconium-95 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Niobium-95 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Molybdenum-99 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Technetium-99 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Technetium-99m | - | 3.3E-03 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 3.0E-05 | #DIV/0! | #DIV/0! | #DIV/0! |
| Ruthenium-103 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Ruthenium-106 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Silver-110m | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Indium-111 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Indium-113m | Indium-111 | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Antimony-125 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Iodine-123 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Iodine-125 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Iodine-129 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Iodine-131 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Iodine-132 | Iodine-133 | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |
| Iodine-133 | - | 0.0E+00 | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! | 0.0E+00 | #DIV/0! | #DIV/0! | #DIV/0! |

Fisherman dose (estuary/coastal)

| Radionuclide | Surrogate radionuclide | External dose μSv/y | Fish dose μSv/y | Total dose μSv/y | % Contribution | Dose per unit release (dpur) | | | | |
|-----------------------------|------------------------|------------------------|--------------------|---------------------|----------------|-----------------------------------|----------------|----------------|----------------|-----------------|
| | | | | | | STW partitioning and decay factor | External dpur | Fish dpur | Total dpur | Worst age group |
| | | | | | | | μSv/y per Bq/y | μSv/y per Bq/y | μSv/y per Bq/y | |
| Tritium | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 8.5E-01 | 0.0E+00 | 6.9E-16 | 8.9E-16 | Offspring |
| Tritium (Organically Bound) | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 8.5E-01 | 0.0E+00 | 3.7E-11 | 3.7E-11 | Offspring |
| Carbon-11 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | None |
| Carbon-14 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 8.5E-01 | 1.8E-16 | 4.8E-10 | 4.8E-10 | Offspring |
| Fluorine-18 | Sodium-24 | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 4.5E-01 | 2.7E-16 | 5.7E-16 | 8.3E-16 | Adult |
| Sodium-22 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 9.0E-01 | 1.4E-13 | 5.9E-14 | 2.0E-13 | Adult |
| Sodium-24 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 4.5E-01 | 2.7E-16 | 5.7E-16 | 8.3E-16 | Adult |
| Phosphorus-32 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 1.9E-01 | 1.3E-17 | 6.8E-09 | 6.8E-09 | Offspring |
| Phosphorus-33 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 2.0E-01 | 6.8E-20 | 1.6E-09 | 1.6E-09 | Offspring |
| Sulphur-35 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 8.9E-01 | 8.4E-20 | 7.9E-15 | 7.9E-15 | Offspring |
| Chlorine-36 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 9.0E-01 | 3.1E-17 | 1.6E-15 | 1.6E-15 | Adult |
| Calcium-45 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 2.0E-01 | 1.9E-17 | 6.7E-13 | 6.7E-13 | Offspring |
| Calcium-47 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 1.8E-01 | 2.3E-14 | 2.3E-13 | 2.5E-13 | Offspring |
| Vanadium-48 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 9.7E-02 | 3.6E-11 | 6.2E-13 | 3.7E-11 | Adult |
| Chromium-51 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 9.8E-02 | 3.7E-13 | 2.3E-13 | 6.0E-13 | Adult |
| Manganese-52 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 4.6E-01 | 1.2E-11 | 7.9E-12 | 2.0E-11 | Adult |
| Manganese-54 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 5.0E-01 | 2.2E-10 | 5.0E-12 | 2.3E-10 | Adult |
| Manganese-56 | Manganese-54 | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 5.0E-01 | 2.2E-10 | 5.0E-12 | 2.3E-10 | Adult |
| Iron-55 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 1.0E-01 | 0.0E+00 | 3.0E-13 | 3.0E-13 | Adult |
| Iron-59 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 9.9E-02 | 4.7E-11 | 1.5E-12 | 4.9E-11 | Adult |
| Cobalt-56 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 2.0E-01 | 2.3E-10 | 5.0E-11 | 2.8E-10 | Adult |
| Cobalt-57 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 2.0E-01 | 1.9E-11 | 4.4E-12 | 2.3E-11 | Adult |
| Cobalt-58 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 2.0E-01 | 5.4E-11 | 1.5E-11 | 6.9E-11 | Adult |
| Cobalt-60 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 2.0E-01 | 2.7E-09 | 7.5E-11 | 2.8E-09 | Adult |
| Nickel-63 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 5.0E-01 | 0.0E+00 | 3.6E-12 | 3.6E-12 | Adult |
| Zinc-65 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 5.0E-01 | 8.0E-11 | 3.3E-09 | 3.4E-09 | Adult |
| Gallium-67 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 8.7E-02 | 5.9E-16 | 1.1E-12 | 1.1E-12 | Adult |
| Selenium-75 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 5.0E-01 | 2.6E-12 | 6.4E-10 | 6.4E-10 | Adult |
| Bromine-82 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 6.7E-01 | 8.2E-16 | 1.5E-14 | 1.5E-14 | Adult |
| Rubidium-82 | Rubidium-83 | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 2.0E-01 | 2.3E-13 | 3.2E-12 | 3.4E-12 | Adult |
| Rubidium-83 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 2.0E-01 | 2.3E-13 | 3.2E-12 | 3.4E-12 | Adult |
| Strontium-89 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 8.9E-01 | 4.0E-17 | 1.5E-12 | 1.5E-12 | Offspring |
| Strontium-90 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 9.0E-01 | 1.0E-15 | 6.1E-12 | 6.1E-12 | Offspring |
| Yttrium-90 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 7.6E-01 | 8.4E-15 | 6.5E-13 | 6.8E-13 | Adult |
| Zirconium-95 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 9.9E-02 | 8.6E-11 | 6.5E-13 | 8.7E-11 | Adult |
| Niobium-95 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 4.9E-01 | 2.2E-11 | 2.0E-13 | 2.2E-11 | Adult |
| Molybdenum-99 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 7.7E-01 | 3.9E-15 | 2.1E-13 | 2.2E-13 | Adult |
| Technetium-99 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 9.0E-01 | 1.0E-16 | 7.0E-12 | 7.0E-12 | Adult |
| Technetium-99m | - | 7.6E-09 | 3.0E-05 | 3.0E-05 | 100.00 % | 1.6E-01 | 1.8E-18 | 7.2E-15 | 7.2E-15 | Adult |
| Ruthenium-103 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 8.9E-01 | 7.6E-12 | 1.2E-12 | 8.8E-12 | Adult |
| Ruthenium-106 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 9.0E-01 | 3.5E-11 | 1.3E-11 | 4.8E-11 | Adult |
| Silver-110m | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 9.9E-02 | 1.2E-10 | 3.9E-09 | 4.0E-09 | Adult |
| Indium-111 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 8.5E-02 | 1.8E-13 | 6.0E-12 | 6.1E-12 | Adult |
| Indium-113m | Indium-111 | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 8.5E-02 | 1.8E-13 | 6.0E-12 | 6.1E-12 | Adult |
| Antimony-125 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 2.0E-01 | 1.5E-11 | 1.5E-11 | 2.9E-11 | Adult |
| Iodine-123 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 3.6E-01 | 7.7E-18 | 3.0E-15 | 3.0E-15 | Adult |
| Iodine-125 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 7.9E-01 | 2.1E-16 | 3.0E-12 | 3.0E-12 | Adult |
| Iodine-129 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 8.0E-01 | 5.4E-15 | 2.5E-11 | 2.5E-11 | Adult |
| Iodine-131 | - | 0.0E+00 | 0.0E+00 | 0.0E+00 | | 7.6E-01 | 2.5E-15 | 2.5E-12 | 2.5E-12 | Adult |

Estuary/coastal wildlife dose

| Radionuclide | Surrogate radionuclide | Worst affected organism | % Contribution | Dose per unit release | |
|-----------------------------|------------------------|-------------------------|----------------|-----------------------------------|-------------------------|
| | | | | STW partitioning and decay factor | Worst affected organism |
| | | | | | |
| Tritium | - | 0,0E+00 | | 8,5E-01 | 3,1E-18 |
| Tritium (Organically Bound) | Carbon-14 | 0,0E+00 | | 8,5E-01 | 1,7E-13 |
| Carbon-11 | - | 0,0E+00 | | 0,0E+00 | 0,0E+00 |
| Carbon-14 | - | 0,0E+00 | | 8,5E-01 | 1,7E-13 |
| Fluorine-18 | Technetium-99m | 0,0E+00 | | 4,5E-01 | 1,3E-14 |
| Sodium-22 | Caesium-137 | 0,0E+00 | | 9,0E-01 | 2,4E-13 |
| Sodium-24 | Caesium-137 | 0,0E+00 | | 4,5E-01 | 2,4E-13 |
| Phosphorus-32 | - | 0,0E+00 | | 1,9E-01 | 4,8E-13 |
| Phosphorus-33 | Phosphorus-32 | 0,0E+00 | | 2,0E-01 | 4,8E-13 |
| Sulphur-35 | - | 0,0E+00 | | 8,9E-01 | 1,5E-13 |
| Chlorine-36 | Iodine-129 | 0,0E+00 | | 9,0E-01 | 5,5E-14 |
| Calcium-45 | Strontium-90 | 0,0E+00 | | 2,0E-01 | 2,0E-13 |
| Calcium-47 | Strontium-90 | 0,0E+00 | | 1,8E-01 | 2,0E-13 |
| Vanadium-48 | Caesium-137 | 0,0E+00 | | 9,7E-02 | 2,4E-13 |
| Chromium-51 | Cobalt-60 | 0,0E+00 | | 9,8E-02 | 6,3E-12 |
| Manganese-52 | Manganese-54 | 0,0E+00 | | 4,6E-01 | 6,3E-12 |
| Manganese-54 | Cobalt-60 | 0,0E+00 | | 5,0E-01 | 6,3E-12 |
| Manganese-56 | Technetium-99m | 0,0E+00 | | 5,0E-01 | 1,3E-14 |
| Iron-55 | Cobalt-60 | 0,0E+00 | | 1,0E-01 | 6,3E-12 |
| Iron-59 | Cobalt-60 | 0,0E+00 | | 9,9E-02 | 6,3E-12 |
| Cobalt-56 | Cobalt-60 | 0,0E+00 | | 2,0E-01 | 6,3E-12 |
| Cobalt-57 | Cobalt-60 | 0,0E+00 | | 2,0E-01 | 6,3E-12 |
| Cobalt-58 | Cobalt-60 | 0,0E+00 | | 2,0E-01 | 6,3E-12 |
| Cobalt-60 | - | 0,0E+00 | | 2,0E-01 | 6,3E-12 |
| Nickel-63 | Caesium-137 | 0,0E+00 | | 5,0E-01 | 2,4E-13 |
| Zinc-65 | Caesium-137 | 0,0E+00 | | 5,0E-01 | 2,4E-13 |
| Gallium-67 | Cobalt-60 | 0,0E+00 | | 8,7E-02 | 6,3E-12 |
| Selenium-75 | Caesium-137 | 0,0E+00 | | 5,0E-01 | 2,4E-13 |
| Bromine-82 | Iodine-131 | 0,0E+00 | | 6,7E-01 | 7,4E-14 |
| Rubidium-82 | Strontium-90 | 0,0E+00 | | 2,0E-01 | 2,0E-13 |
| Rubidium-83 | Strontium-90 | 0,0E+00 | | 2,0E-01 | 2,0E-13 |
| Strontium-89 | Strontium-90 | 0,0E+00 | | 8,9E-01 | 2,0E-13 |
| Strontium-90 | - | 0,0E+00 | | 9,0E-01 | 2,0E-13 |
| Yttrium-90 | Strontium-90 | 0,0E+00 | | 7,6E-01 | 2,0E-13 |
| Zirconium-95 | Caesium-137 | 0,0E+00 | | 9,9E-02 | 2,4E-13 |
| Niobium-95 | Caesium-137 | 0,0E+00 | | 4,9E-01 | 2,4E-13 |
| Molybdenum-99 | Iodine-129 | 0,0E+00 | | 7,7E-01 | 5,5E-14 |
| Technetium-99 | - | 0,0E+00 | | 9,0E-01 | 1,5E-13 |
| Technetium-99m | - | 5,5E-05 | 100,00 % | 1,6E-01 | 1,3E-14 |
| Ruthenium-103 | Ruthenium-106 | 0,0E+00 | | 8,9E-01 | 5,3E-11 |
| Ruthenium-106 | - | 0,0E+00 | | 9,0E-01 | 5,3E-11 |
| Silver-110m | Caesium-137 | 0,0E+00 | | 9,9E-02 | 2,4E-13 |
| Indium-111 | Ruthenium-106 | 0,0E+00 | | 8,5E-02 | 5,3E-11 |
| Indium-113m | Ruthenium-106 | 0,0E+00 | | 8,5E-02 | 5,3E-11 |
| Antimony-125 | Ruthenium-106 | 0,0E+00 | | 2,0E-01 | 5,3E-11 |
| Iodine-129 | Iodine-131 | 0,0E+00 | | 3,6E-01 | 7,4E-14 |