



Environmental Risk Assessment Techniques Used at U.S. DOE Sites

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Overview

- **DOE Standard-** A Graded Approach for Evaluating Radiation Doses to aquatic and Terrestrial Biota DOE-STD-1153-2002
- **RESRAD BIOTA:** A Tool for Implementing a Graded Approach to Biota Dose Evaluation
- **Case Study:** INEEL 2002

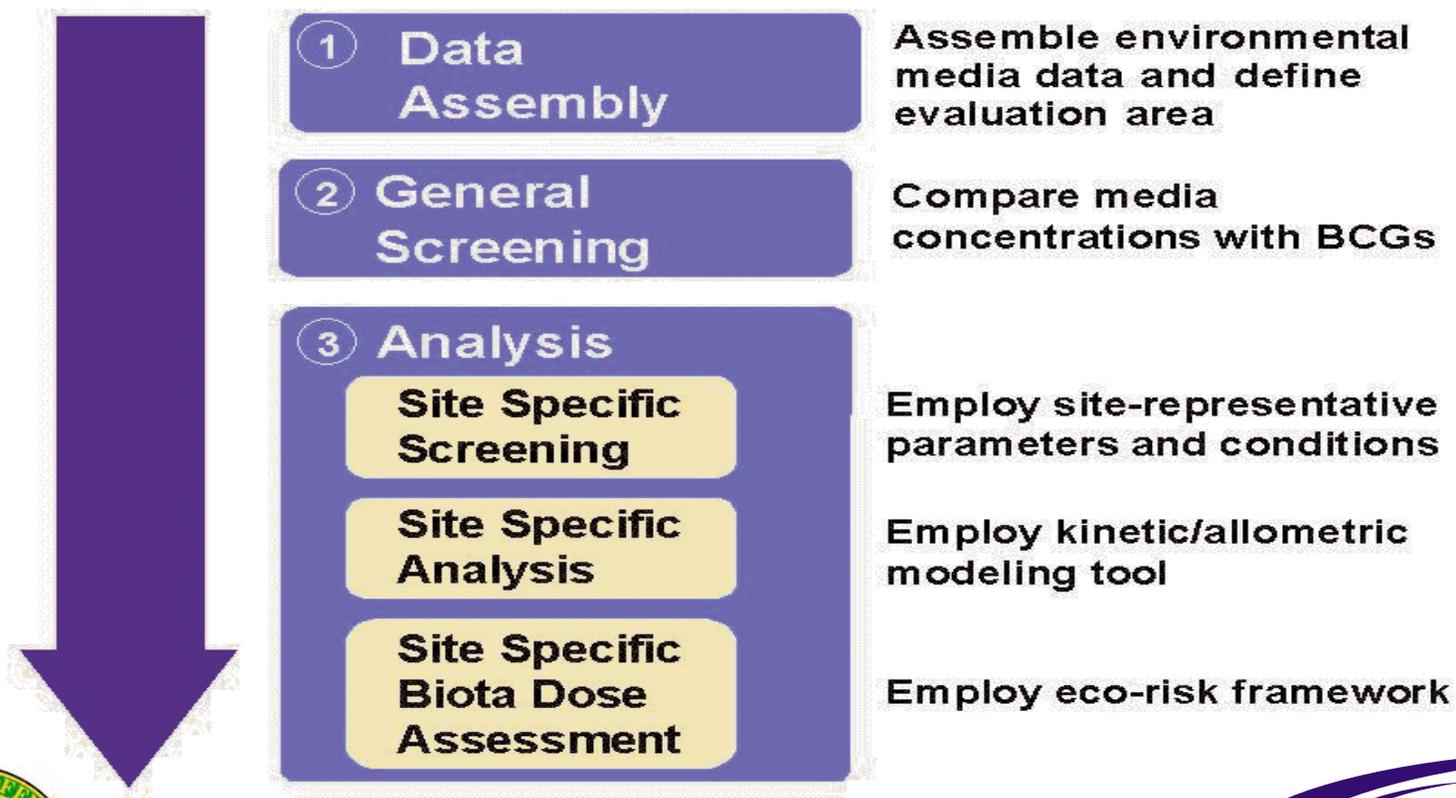


DOE Dose Rate Criteria

- Terrestrial animals: 1mGy/day
- Terrestrial plants: 10mGy/day
- Aquatic animals: 10mGy/day



Overview of DOE's Graded Approach



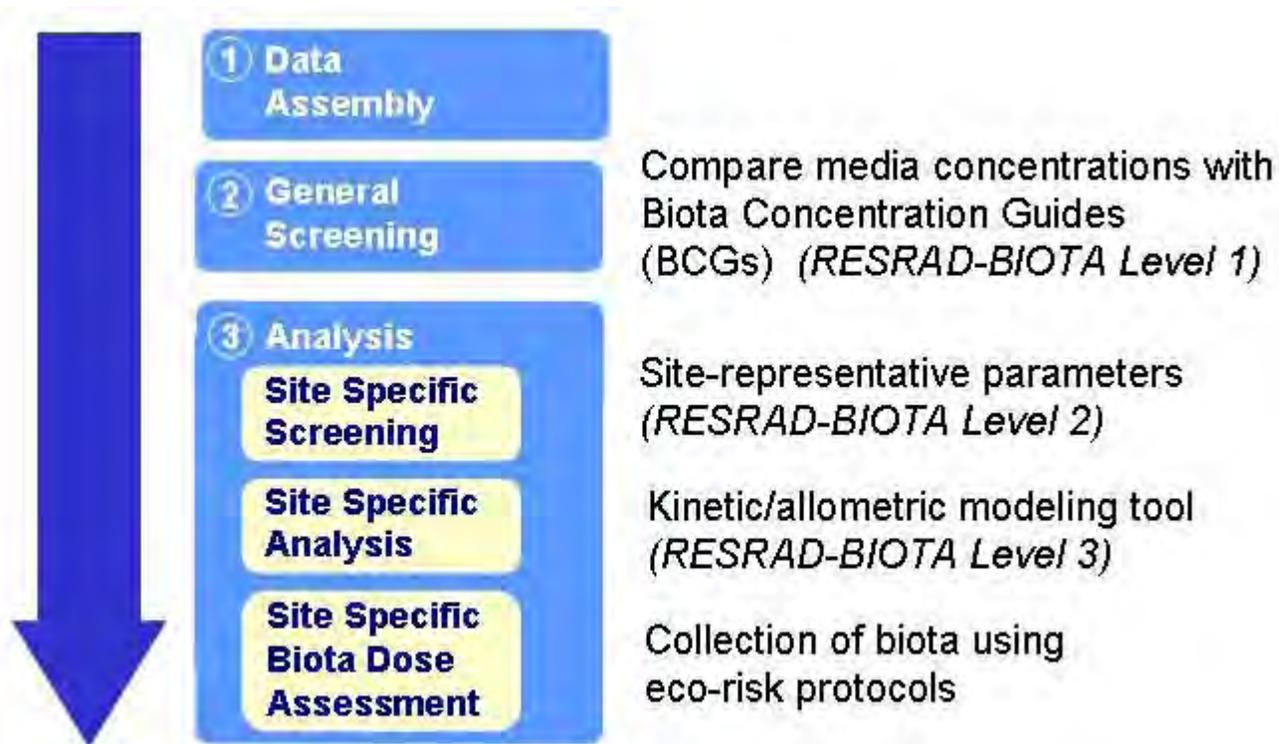


RESRAD Biota

- Computer model by Argonne National Lab for implementing screening and analysis methods contained in DOE Standard 1153
- Estimate radiation dose from RESidual ^{w2} RADioactive material (RESRAD) biota code
- Used to assess compliance with DOE criteria which are consistent with national and internationally recommended does guidelines for biota
- Conduct ecological assessments of radiological impact



RESRAD Biota

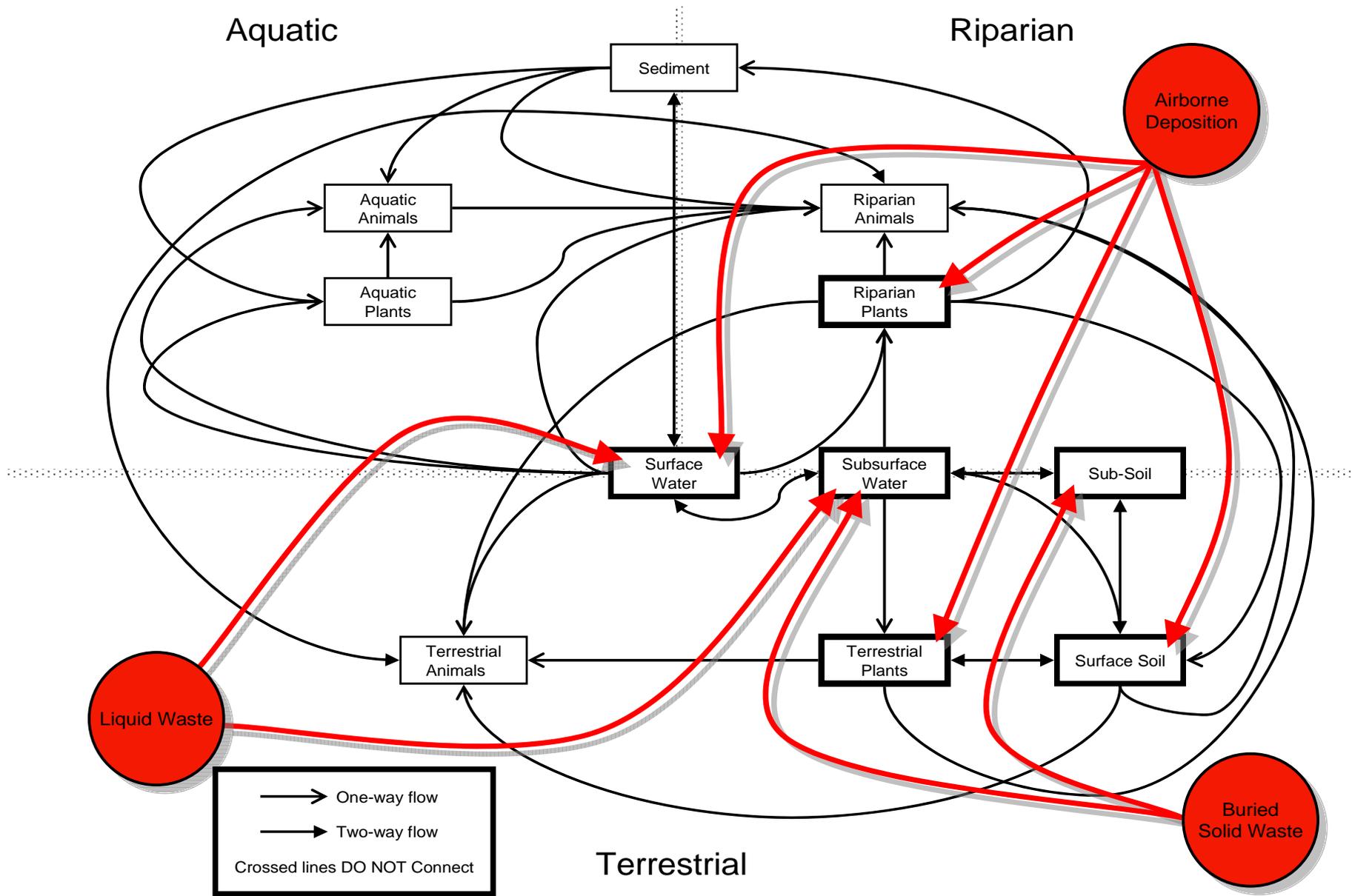




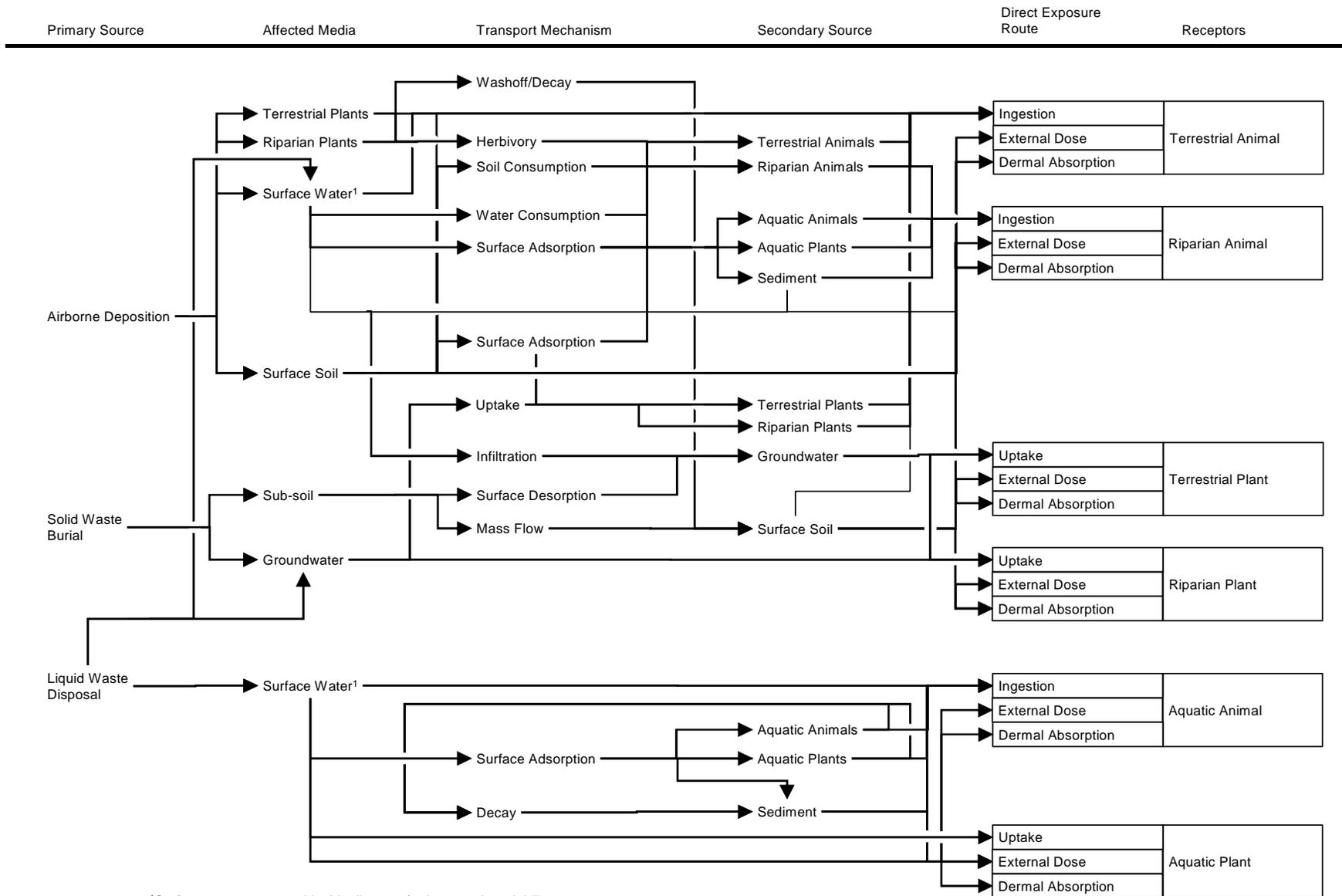
Case Study INEEL, 2002



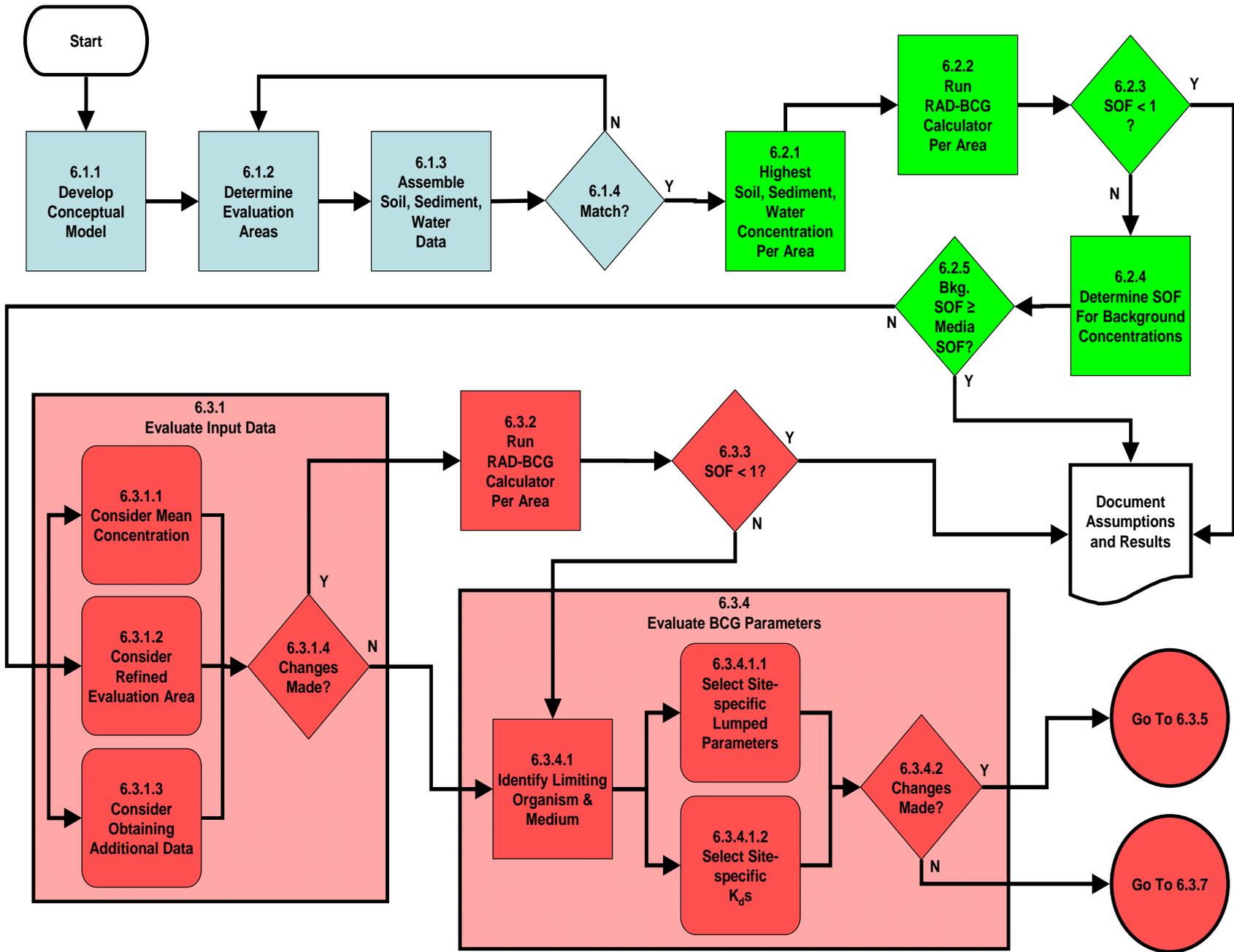
- Consider mean concentrations of radionuclides rather than maxima
- Consider refining evaluation area
- Consider site-specific information for lumped parameters
- Consider using correction factor other than 100% for residence time and spatial usage in favor of more realistic assumptions
- Consider developing/applying more site specific information about food sources, uptake and intake
- Conduct a complete site-specific dose analysis



Conceptual model of the INEEL environment for use in a biota dose assessment using the Graded Approach



Pathway diagram showing the potential pathways by which non-human receptors could be exposed to environmental radioactivity.



Flow chart of the biota dose assessment process.



References



- DOE Standard A Graded Approach for Evaluating Radiation doses to Aquatic and Terrestrial Biota; DOE-STD-1153-2002
- RESRAD-BIOTA: A Tool for Implementing a Graded Approach to Biota Dose Evaluation; DOE/EH 0676
- Technical Assistance in conducting a Site Self-Assessment Using RESRAD-BIOTA ; HS-20-IB-2008
- Biota Dose Assessment Guidance for the INEEL ; NW-ID-2003-062