

WBN2Public Resource

From: Poole, Justin
Sent: Wednesday, May 11, 2011 11:31 AM
To: Crouch, William D
Cc: WBN2HearingFile Resource
Subject: Request for Information from Public Meeting on 5/11/11
Attachments: Additional Information_Clarification_5_04_11_Watts Bar.docx

Bill,

The following was a handout during our public meeting on the review of Chapter 11/12 and the environmental review. The staff asked that you provide the information in this table that is applicable. This information is being requested as part of the effort to ensure consistency between the FSAR review and environmental review.

Justin C. Poole
Project Manager
NRR/DORL/LPWB
U.S. Nuclear Regulatory Commission
(301)415-2048
email: Justin.Poole@nrc.gov

Hearing Identifier: Watts_Bar_2_Operating_LA_Public
Email Number: 389

Mail Envelope Properties (19D990B45D535548840D1118C451C74D804651D13C)

Subject: Request for Information from Public Meeting on 5/11/11
Sent Date: 5/11/2011 11:31:16 AM
Received Date: 5/11/2011 11:31:18 AM
From: Poole, Justin

Created By: Justin.Poole@nrc.gov

Recipients:

"WBN2HearingFile Resource" <WBN2HearingFile.Resource@nrc.gov>

Tracking Status: None

"Crouch, William D" <wdcrouch@tva.gov>

Tracking Status: None

Post Office: HQCLSTR02.nrc.gov

Files	Size	Date & Time
MESSAGE	498	5/11/2011 11:31:18 AM
Additional Information_Clarification_5_04_11_Watts Bar.docx	43104	

Options

Priority: Standard

Return Notification: No

Reply Requested: No

Sensitivity: Normal

Expiration Date:

Recipients Received:

Information Required for Staff Analysis for Dose from Gaseous Effluents

The staff will be performing dose assessment for dose to the public from gaseous effluents from Watts Bar Nuclear Unit 2 using the NRC developed GASPAR II computer code (Streng et al. 1986) developed using the approach specified in Regulatory Guide 1.109 (NRC 1977). The following is a list of input values needed to run the computer code. Provide the data, the source of the data and any appropriate assumptions. Refer to RG 1.109 for any questions on the need for the parameter or more detail on what the parameter is.

Please provide answers to the following questions, as well as Tables 1-5.

- a. Confirm that there are no milk goat or meat animals are present in the 5-mi radius.
- b. Provide the direction and distance for the nearest residence, nearest garden, and nearest milk cow.
- c. Confirm that releases are calculated as ground level releases
- d. Provide nearest site boundary distances for the 16 cardinal compass directions
- e. Provide the estimate of direct radiation doses from sources within the site for each of the 22.5-degree radial sectors centered on the 16 cardinal compass directions for radial distances of 2, 4, 6, 8, 10, 20, 40, 60, and 80 km (1.2, 2.5, 3.7, 5, 6.2, 12, 25, 27, and 50 mi) from the reactor.
- f. Confirm that there are no unusual animals, plants, agricultural practices, game harvests, or food processing operations having the potential to contribute 10 percent or more to either individual or population doses in areas affected by liquid effluents, and food-processing operations involving large quantities of water.
- g. Identify and provide a reference for direct radiation sources within or onsite out-of-plant as solid waste (e.g., independent fuel storage).

Table 1.

Item	Parameter	Units	Value	Source	Assumptions
1	Distance (in miles) from the site to the northeast corner of the U.S.	miles			
2	Fraction of the year that leafy vegetables are grown				
3	Fraction of the year that milk cows are on pasture				
4	Fraction of the maximum individual's vegetable intake that				

	is from his own garden				
5	Fraction of milk-cow feed intake that is from pasture while on pasture.				
6	Average absolute humidity over the growing season	g/m ³			
7	Average temperature over the growing season (deg F). T is used only to calculate absolute humidity. If T is supplied, H must be supplied as relative humidity (%). Otherwise set T=0 or blank				
8	Fraction of the year that goats are on pasture.				
9	Fraction of goat-feed intake that is from pasture while on pasture				
10	Fraction of the year that beef cattle are on pasture.				
11	Fraction of beef-cattle feed intake that is from pasture while the cattle are on pasture.				
12	Consumption factors for milk, meat, leafy vegetables, and vegetables	Milk (L/yr) Adult Teen Child Infant Meat (kg/yr) Adult Teen Child Infant Leafy Vegetable (kg/yr) Adult Teen Child Infant Vegetable (kg/yr)			

Information Required for Staff Analysis for Dose from Liquid Effluents

The staff will be performing dose assessment for dose to the public from liquid effluents from Watts Bar Nuclear Unit 2 using the NRC developed LADTAP II computer code (Streng et al. 1986) developed using the approach specified in Regulatory Guide 1.109 (NRC 1977). The following is a list of input values needed to run the computer code. Provide the data, the source of the data and any appropriate assumptions. Refer to RG 1.109 for any questions on the need for the parameter or more detail on what the parameter is. Some supplementary information is provided in Regulatory Guide 1.113 (NRC 1977) to which the licensee is referred.

1. The staff compares their calculations against the applicants. Will TVA be revising the information in the TVA application or will the staff's comparison be against the 2008 application?
2. Projected population by sector and radial distance around the WBN2 site for the year 2040, including totals for each sector and a total population. See Table I below

Table I. Projected Population by Sector and Radial Distance Around the WBN2 Site for the Year 2040. Population with Projections to the Year 2040

Sectors	Year	Radii/Distances (mi)												
		0-1	1-2	2-3	3-4	4-5	5-10	0-10 ^(a)	10-20	20-30	30-40	40-50	0-50	
North	2040													
North-Northeast	2040													
Northeast	2040													
East-Northeast	2040													
East	2040													
East-Southeast	2040													
Southeast	2040													
South-Southeast	2040													
South	2040													
South-Southwest	2040													
Southwest	2040													
West-Southwest	2040													
West	2040													
West-Northwest	2040													
Northwest	2040													
North-Northwest	2040													
Total														

Table II.

Item	Parameter	Units	Value	Source	Assumptions
1	Liquid effluent discharge rate	ft ³ /s			
2	Reconcentration model (see Reg Guide 1.113)	No model / completely			

		mixed model/plug-flow model/partially mixed model			
3	Effluent discharge rate to receiving body	ft ³ /s			
	Total volume of impoundment	ft ³			
4	Fraction of population who are adults				
5	Fraction of Adults who are teens				
6	Fraction of adults who are children				
7	Liquid effluent source term by radionuclide	(Ci/yr)			
8					
9	Shore width factor (see Reg Guide 1.109)				
	Include items 10-14 or items 15-20				
10	Dilution factor for aquatic food pathways and external exposure while boating				
11	Dilution factor for shoreline and swimming exposure				
12	Dilution factor for drinking water pathway				
13	Transit time from discharge to exposure location for all pathways except drinking water	h			
14	Transit time from discharge to drinking water supply	h			
	Include Items 15-20 if no value was given for items 10-12. Include one set of items 15-20 for each dilution factor (Items 10-12) not provided above				
15	Surface water model	-			
16	Average flow velocity	Ft/s			
17	Average depth of water body	ft			
18	Downshore distance from discharge point to usage location	ft.			
19	Offshore, distance to water usage location	ft.			
20	Width of river or depth of discharge point in lake	ft.			
21	Consumption and usage factors for adults, teens, children, and infants	Shoreline usage (hr/yr) (adult) (teen) (child) (infant) Water usage (L/yr)			

		(adult)			
		(teen)			
		(child)			
		(infant)			
		Fish consumption (kg/yr)			
		(adult)			
		(teen)			
		(child)			
		(infant)			
	For Each Sport Fishing Usage Location				
22	Surface water model	-			
23	Average flow velocity	Ft/s			
24	Average depth of water body	ft			
25	Downshore distance from discharge point to usage location	ft.			
26	Offshore, distance to water usage location	ft.			
27	Width of river or depth of discharge point in lake	ft.			
	Sport Fish harvest – Provide a separate dataset for each location				
28	identification				
29	Fish Harvest	Kg/yr			
30	Dilution				
31	Transit time	h			
	Commercial fish harvest – provide a separate dataset for each location				
32	identification				
33	Fish Harvest	Kg/yr			
34	Dilution				
35	Transit time	h			
	Sport invertebrate harvest – provide a separate dataset for each location				
36	identification				
37	invertibrate Harvest	Kg/yr			
38	Dilution				
39	Transit time	h			
	Commercial invertebrate harvest – provide a separate dataset for each location				
40	identification				
41	invertibrate Harvest	Kg/yr			
42	Dilution				
43	Transit time	h			
	Population shoreline – provide a separate dataset for each location				

44	identification				
45	Dilution				
46	Transit time	Hr			
47	Usage (person-hours)				
48	Shorewidth factor				
	Population swimming – provide a separate dataset for each location				
49	Identification				
50	Total Exposure time for swimming for the current usage location	Hr/y			
51	Dilution Factor for the current swimming location	-			
52	Transit time from the release point to the current usage location	hr			
	Population Boating – provide a separate dataset for each location				
53	Identification				
54	Total Exposure time for boating for the current usage location	Hr/y			
55	Dilution Factor for the current swimming location	-			
56	Transit time from the release point to the current usage location	hr			
	Population drinking water – provide a separate dataset for each location				
57	Supplier Identification				
58	Total population supplied by the current drinking water location				
59	Dilution factor for current usage location intake				
60	Transit time from discharge point (to receiving water body)	hr			
61	Supply rate of drinking water for current water plant. (used only if pop = 0)	Gal/d			
62	Ave. rate of water usage by individuals for the current water-plant service area (used only if pop = 0)	Gal/d			
63	Surface water model	-			
64	Average flow velocity	Ft/s			
65	Average depth of water body	Ft			
66	Downshore distance from discharge point to usage location	ft.			
67	Offshore, distance to water usage location	ft.			
68	Width of river or depth of discharge point in lake	ft.			
	Irrigated foods: include a separate dataset for each irrigated food. If there are no irrigated foods these items may be omitted				
69	Food type	Vegetation/leafy vegetation/milk/meat			
70	Irrigation rate	L.m ⁻² .mo ⁻¹			
71	Fr. of animal feed not produced with contaminated irrigation water				

72	Fr. of animal drinking water not obtained from contaminated irrigation water supply.				
73	Total production of food product within 50 miles of the site	Kg/y or L/y			
74	Growing period for current food product	D			
75	Crop yield for current food product	Kg/m ²			
76	Rate of consumption by maximally exposed adult	Kg/y			
77	Rate of consumption by maximally exposed teen	Kg/y			
78	Rate of consumption by maximally exposed child	Kg/y			
79	Average rate of consumption by an adult in local population	Kg/y			
80	Average rate of consumption by a teen in local population	Kg/y			
81	Average rate of consumption by a child in local population	Kg/y			
82	Holdup time between harvest and consumption by average members of population	Hr			
83	Holdup time between harvest and consumption by maximally exposed members of population	Hr			
84	Dilution Factor for irrigation water usage location for the current food product	-			
85	Production rate for the current food product using current irrigation water supply	Kg/y or L/y			
86	Transit time from the release point to the current usage location	Hr			
	Items 88-93 (only if dilution factors not given above)				
88	Surface water model	-			
89	Average flow velocity	Ft/s			
90	Average depth of water body	Ft			
91	Downshore distance from discharge point to usage location	ft.			
92	Offshore, distance to water usage location	ft.			
93	Width of river or depth of discharge point in lake	ft.			
	Biota Exposure Location Data: The following data are for calculation of dose to biota				
94	Location identifier				
95	Dilution Factor for current exposure location for biota	-			
96	Transit time from the effluent release location to current exposure location	hr			
	Include items 97-102 following only if no dilution factor was given for biota				

97	Surface water model	-			
98	Average flow velocity	Ft/s			
99	Average depth of water body	Ft			
100	Downshore distance from discharge point to usage location	ft.			
101	Offshore, distance to water usage location	ft.			
102	Width of river or depth of discharge point in lake	ft.			