Nuclide Analysis Results of Radioactive Materials in Seawater <Coast>

Reference

(Data summarized on February 17)

Place of Sampling	North of Discharge Channel of 5-6u of 1F (approx. 30m north of 5-6u discharge channel)		Around South Discharge Channel of 1F (appox. 330m south of 1-4u Discharge Channel)		Around North Discharge Channel of 2F (Around 3,4u Discharge Channel) (approx. 10 km from 1F)		Around Iwasawa Shore of 2F (appox. 7 km south of 1,2u Discharge Channel) (appox. 16 km from 1F)		② Density limit by the announcement of Reactor Regulation (Bq/L) (the density limit in the water outside of surrounding monitored areas in the section 6 of the appendix 2)
Time of Sampling	Feb 16, 2012 08:40 am		Feb 16, 2012 08:20 am		Feb 16, 2012 08:30 am		Feb 16, 2012 08:05 am		
Detected Nuclides (Half-life)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	
I-131 (about 8 days)	ND	-	ND	-	ND	-	ND	-	40
Cs-134 (about 2 years)	ND	-	1.8	0.03	ND	-	ND	-	60
Cs-137 (about 30 years)	1.1	0.01	2.5	0.03	ND	-	1.1	0.01	90

* Density by the announcement of Reactor Regulation is stated with an amount converted from Bq/cm3 to Bq/L.

* Data of other nuclides are under evaluation.

* In the case that two or more kinds of nuclides exist, sum of each scaling factor to the density limit is compared with 1.

* "ND" means the sampled data is below measurable limit.
I-131: approx. 0.71Bq/L, Cs-134: approx. 0.90Bq/L, Cs-137: approx. 0.98Bq/L
Please note that these nuclides are sometimes detected even when they are below the limits, contingent on the detector or samples.

Nuclide Analysis Results of Radioactive Materials in Seawater <Offshore 1/2>

Reference

(Data summarized on February 17)

Place of Sampling	15 km offshore of Minami-Souma CityUpper Layer		15 km offshore of Minami-Souma CityLower Layer		15 km offshore of Ukedo-gawa Upper Layer		15 km offshore of Ukedo-gawa Lower Layer		15 km offshore of Fukushima Daiichi Upper Layer		15 km offshore of Fukushima Daiichi Lower Layer		② Density limit by the announcement of Reactor Regulation (Bq/L) (the density limit in the water outside of surrounding monitored areas in the section 6 of the appendix 2)
Time of Sampling	Feb 15, 2012 (Not sampled)		Feb 15, 2012 (Not sampled)		Feb 15, 2012 10:15 am		Feb 15, 2012 10:15 am		Feb 15, 2012 09:45 am		Feb 15, 2012 09:45 am		
Detected Nuclides (Half-life)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	
I-131 (about 8 days)	-	-	-	-	ND	-	ND	-	ND	-	ND	-	40
Cs-134 (about 2 years)	-	-	-	-	ND	-	ND	-	ND	-	ND	-	60
Cs-137 (about 30 years)	-	-	-	-	ND	-	ND	-	ND	-	ND	-	90

Place of Sampling	15 km offshore of Fukushima Daini Upper Layer		15 km offshore of Fukushima Daini Lower Layer		15 km offshore of Iwasawa Shore Upper Layer		15 km offshore of Iwasawa Shore Lower Layer		15 km offshore of Hirono-town Upper Layer		15 km offshore of Hirono-town Lower Layer		② Density limit by the announcement of Reactor Regulation (Bq/L) (the density limit in the water outside of surrounding monitored areas in the section 6 of the appendix 2)
Time of Sampling	Feb 15, 2012 09:05 am		Feb 15, 2012 09:05 am		Feb 15, 2012 08:20 am		Feb 15, 2012 08:20 am		Feb 15, 2012 08:15 am		Feb 15, 2012 08:15 am		
Detected Nuclides (Half-life)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	
I-131 (about 8 days)	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	40
Cs-134 (about 2 years)	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	60
Cs-137 (about 30 years)	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	90

* Density by the announcement of Reactor Regulation is stated with an amount converted from Bq/cm3 to Bq/L.

* Data of other nuclides are under evaluation.

1 out 8 samplings was cancelled due to bad weather.

* In the case that two or more kinds of nuclides exist, sum of each scaling factor to the density limit is compared with 1.

* "ND" means the sampled data is below measurable limit.
I-131: approx. 0.69Bq/L, Cs-134: approx. 0.92Bq/L, Cs-137: approx. 1.1Bq/L
Please note that these nuclides are sometimes detected even when they are below the limits, contingent on the detector or samples.

Nuclide Analysis Results of Radioactive Materials in Seawater <Offshore 2/2>

Reference

(Data summarized on February 17)

Place of Sampling	3 km offshore of North of Iwaki Upper Layer		3 km offshore of North of Iwaki Lower Layer		3 km offshore of Natsui river Upper Layer		3 km offshore of Natsui river Lower Layer		3 km offshore of Onahama port Upper Layer		3 km offshore of Onahama port Lower Layer		② Density limit by the announcement of Reactor Regulation (Bq/L) (the density limit in the water outside of surrounding monitored areas in the section 6 of the appendix 2)
Time of Sampling	N/A		N/A		N/A		N/A		Feb 15, 2012 06:40 am		Feb 15, 2012 06:40 am		
Detected Nuclides (Half-life)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	
I-131 (about 8 days)	-	-	-	-	-	-	-	-	ND	-	ND	-	40
Cs-134 (about 2 years)	-	-	-	-	-	-	-	-	ND	-	ND	-	60
Cs-137 (about 30 years)	-	-	-	-	-	-	-	-	ND	-	ND	-	90

Place of Sampling	3 km offshore of Ena Upper Layer		3 km offshore of Ena Lower Layer		3 km offshore of Numanouchi Upper Layer		3 km offshore of Numanouchi Lower Layer		3 km offshore of Toyoma Upper Layer		3 km offshore of Toyoma Lower Layer		② Density limit by the announcement of Reactor Regulation (Bq/L) (the density limit in the water outside of surrounding monitored areas in the section 6 of the appendix 2)
Time of Sampling	Feb 15, 2012 07:00 am		Feb 15, 2012 07:00 am		N/A		N/A		N/A		N/A		
Detected Nuclides (Half-life)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	
I-131 (about 8 days)	ND	-	ND	-	-	-	-	-	-	-	-	-	40
Cs-134 (about 2 years)	ND	-	ND	-	-	-	-	-	-	-	-	-	60
Cs-137 (about 30 years)	ND	-	ND	-	-	-	-	-	-	-	-	-	90

* Density by the announcement of Reactor Regulation is stated with an amount converted from Bq/cm3 to Bq/L.

* Data of other nuclides are under evaluation.

1 out 8 samplings was cancelled due to bad weather.

* In the case that two or more kinds of nuclides exist, sum of each scaling factor to the density limit is compared with 1.

* "ND" means the sampled data is below measurable limit.
I-131: approx. 0.73Bq/L, Cs-134: approx. 0.95Bq/L, Cs-137: approx. 1.0Bq/L
Please note that these nuclides are sometimes detected even when they are below the limits, contingent on the detector or samples.

Nuclide Analysis Results of Radioactive Materials in Seawater <Offshore>

(Data summarized on February 17)

Place of Sampling	Central area of Sendai bay Upper Layer		5 km offshore of Souma City Upper Layer		3 km offshore of Ena Upper Layer		3 km offshore of Oarai shore Upper Layer		② Density limit by the announcement of Reactor Regulation (Bq/L) (the density limit in the water outside of surrounding monitored areas in the section 6 of the appendix 2)
Date of sampling	Jan 17, 2012		Jan 17, 2012		Jan 18, 2012		Jan 18, 2012		
Detected Nuclides (Half-life)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	
I-131 (about 8 days)	ND	-	ND	-	ND	-	ND	-	40
Cs-134 (about 2 years)	ND	-	ND	-	ND	-	ND	-	60
Cs-137 (about 30 years)	ND	-	ND	-	ND	-	ND	-	90
Sr-89 (about 51 days)	ND	-	ND	-	ND	-	ND	-	300
Sr-90 (about 29 years)	0.088	0.00	0.013	0.00	0.014	0.00	ND	-	30

* Density by the announcement of Reactor Regulation is stated with an amount converted from Bq/cm3 to Bq/L.
* In the case that two or more kinds of nuclides exist, sum of each scaling factor to the density limit is compared with 1.
* The results on I-131, Cs-134 and Cs-137 were reported on Jan 19, 20, 23 and 24.
* In the case the measurement is under the detection threshold, "ND" is marked.
  I-131: approx. 1.0Bq/L，Cs-134: approx. 1.2Bq/L，Cs-137: approx. 1.0Bq/L，Sr-89: approx. 0.03Bq/L，Sr-90: approx. 0.009Bq/L
  In addition, the detection threshold is defferent according to the detectors and the sample forms. So, it is possible to detect the nuclide under detection thre
* Nuclide analysis wad conducted by Japan Chemical Analysis Center.

(Evaluation)

Although the detection of Sr-90 by which this accident is considered to be the cause, it is less than the density limit in the water by the announcement.

Nuclide Analysis Results of Radioactive Materials in Seawater＜Coast and Offshore＞

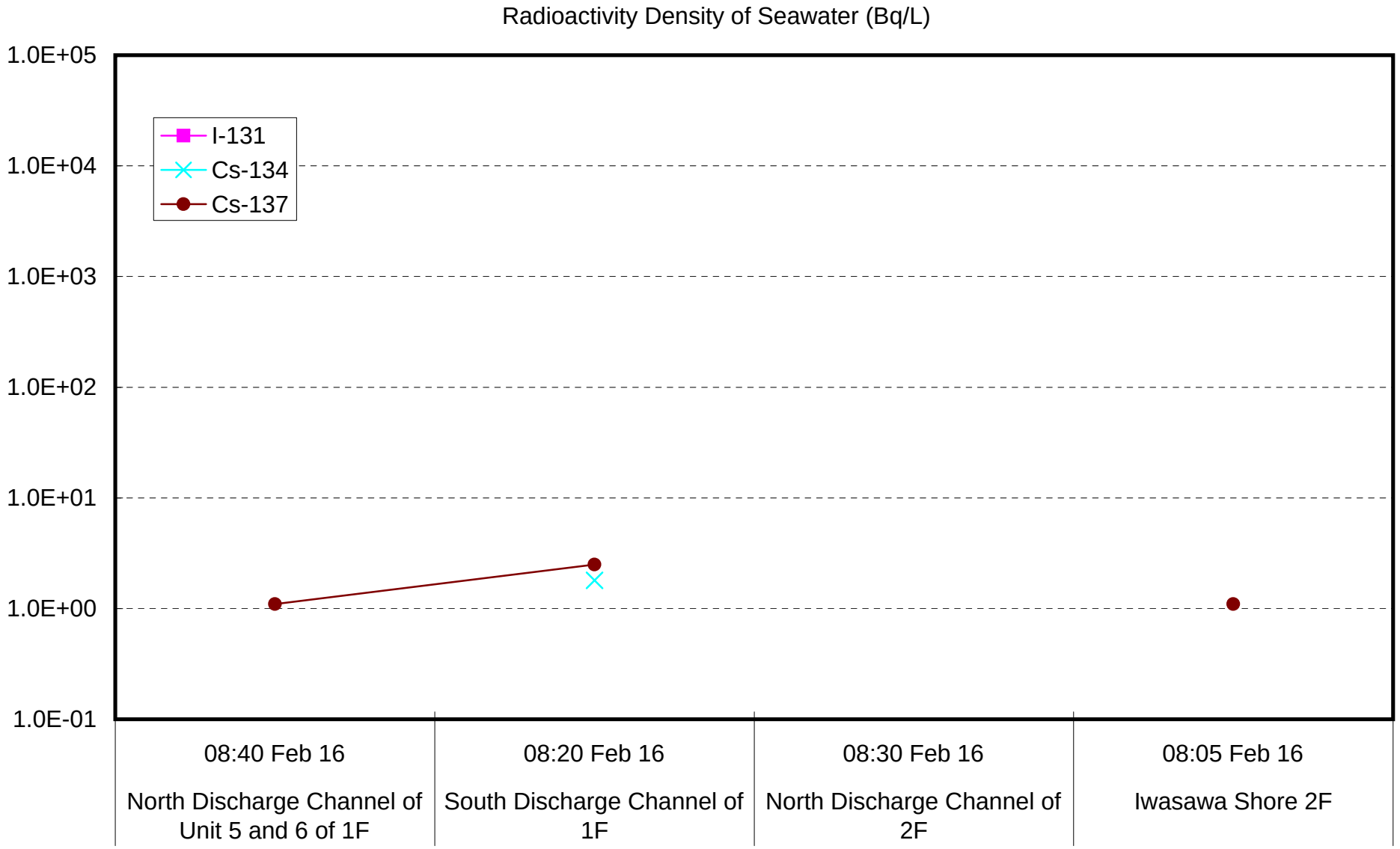
(Data summarized on February 17)

Place of Sampling	North of Discharge Channel of 5-6u of 1F (approx. 30m north of 5-6u discharge channel)		Around South Discharge Channel of 1F （appox. 330m south of 1-4u Discharge Channel)		15 km offshore of Fukushima Daiichi Upper Layer		15 km offshore of Fukushima Daini Upper Layer		② Density limit by the announcement of Reactor Regulation (Bq/L) (the density limit in the water outside of surrounding monitored areas in the section 6 of the appendix 2)
Date of sampling	Jan 16, 2012		Jan 16, 2012		Jan 18, 2012		Jan 18, 2012		
Detected Nuclides (Half-life)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	①Density of Sample (Bq/L)	Scaling Factor (①/②)	
I-131 (about 8 days)	ND	-	ND	-	ND	-	ND	-	40
Cs-134 (about 2 years)	2.0	0.03	1.6	0.03	ND	-	ND	-	60
Cs-137 (about 30 years)	1.8	0.02	2.4	0.03	ND	-	ND	-	90
H-3 (約12年)	ND	-	ND	-	ND	-	ND	-	60,000
全α	ND	-	ND	-	ND	-	ND	-	-
全β	20	-	ND	-	ND	-	19	-	-
Sr-89 (about 51 days)	0.13	0.00	0.15	0.00	ND	-	ND	-	300
Sr-90 (about 29 years)	0.75	0.03	0.82	0.03	0.011	0.00	0.023	0.00	30

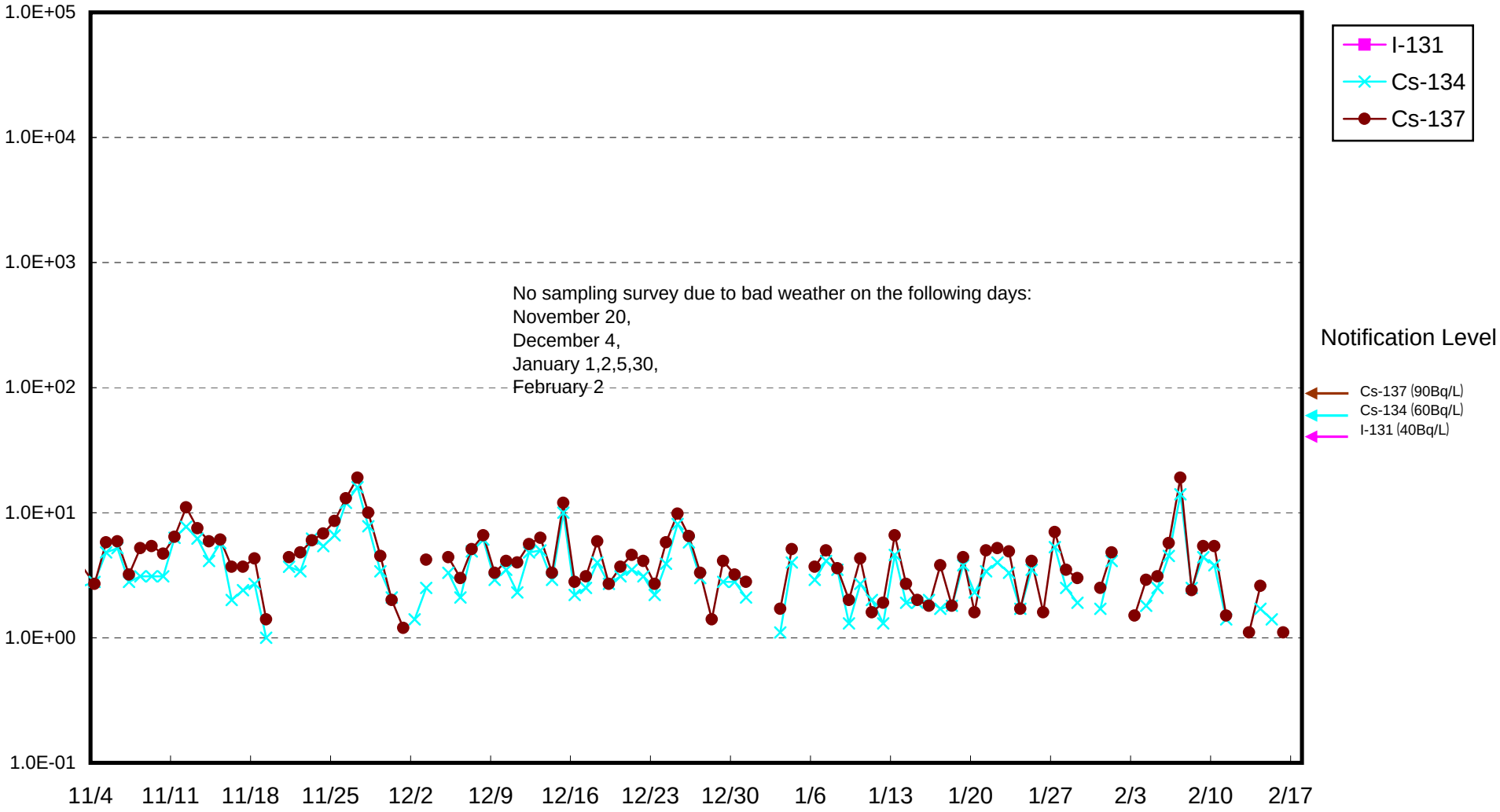
* Density by the announcement of Reactor Regulation is stated with an amount converted from Bq/cm3 to Bq/L.
* In the case that two or more kinds of nuclides exist, sum of each scaling factor to the density limit is compared with 1.
* The results on I-131, Cs-134 and Cs-137 were reported on Jan 17 and 20.
* In the case the measurement is under the detection threshold, "ND" is marked.
  I-131: approx. 0.71Bq/L, Cs-134: approx. 0.89Bq/L, Cs-137: approx. 0.97Bq/L, H-3: approx. 130Bq/L, All α: approx. 3.2Bq/L, All β: approx. 20Bq/L, Sr-8
  In addition, the detection threshold is defferent according to the detectors and the sample forms. So, it is possible to detect the nuclide under detection t
* Nuclide analysis wad conducted by Japan Chemical Analysis Center.

(Evaluation)

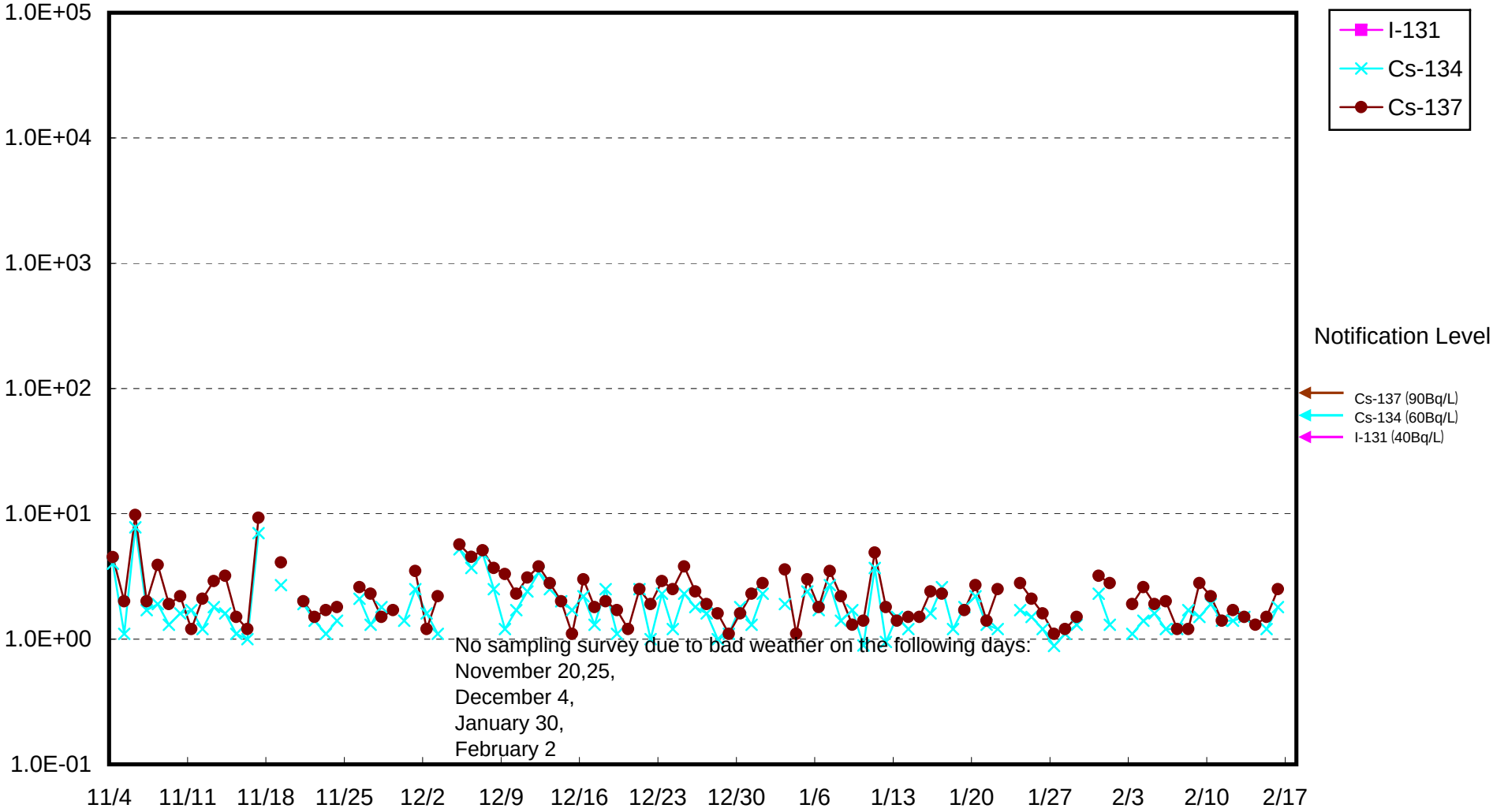
Although the detection of All b radioactive materials, Sr-89 and Sr-90 by which this accident is considered to be the cause, these are less than the density limit in the water by the announcement.


Radioactivity Density of Seawater (Bq/L)
1.0E+05
1.0E+04
1.0E+03
1.0E+02
1.0E+01
1.0E+00
1.0E-01
I-131
Cs-134
Cs-137
08:40 Feb 16
North Discharge Channel of Unit 5 and 6 of 1F
08:20 Feb 16
South Discharge Channel of 1F
08:30 Feb 16
North Discharge Channel of 2F
08:05 Feb 16
Iwasawa Shore 2F

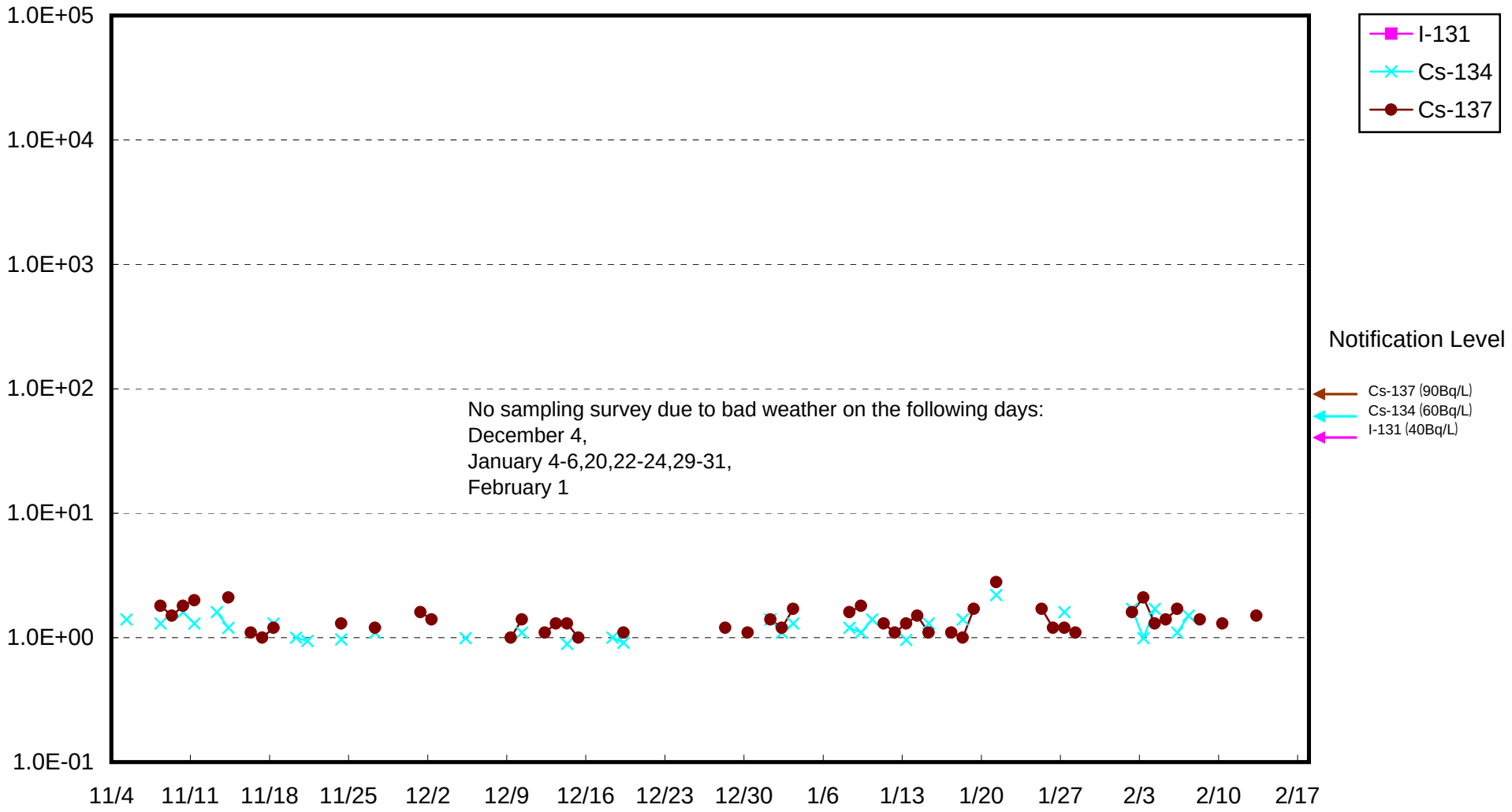
Radioactivity Density of Seawater at North of 1F5-6 Discharge Channel (Bq/L)



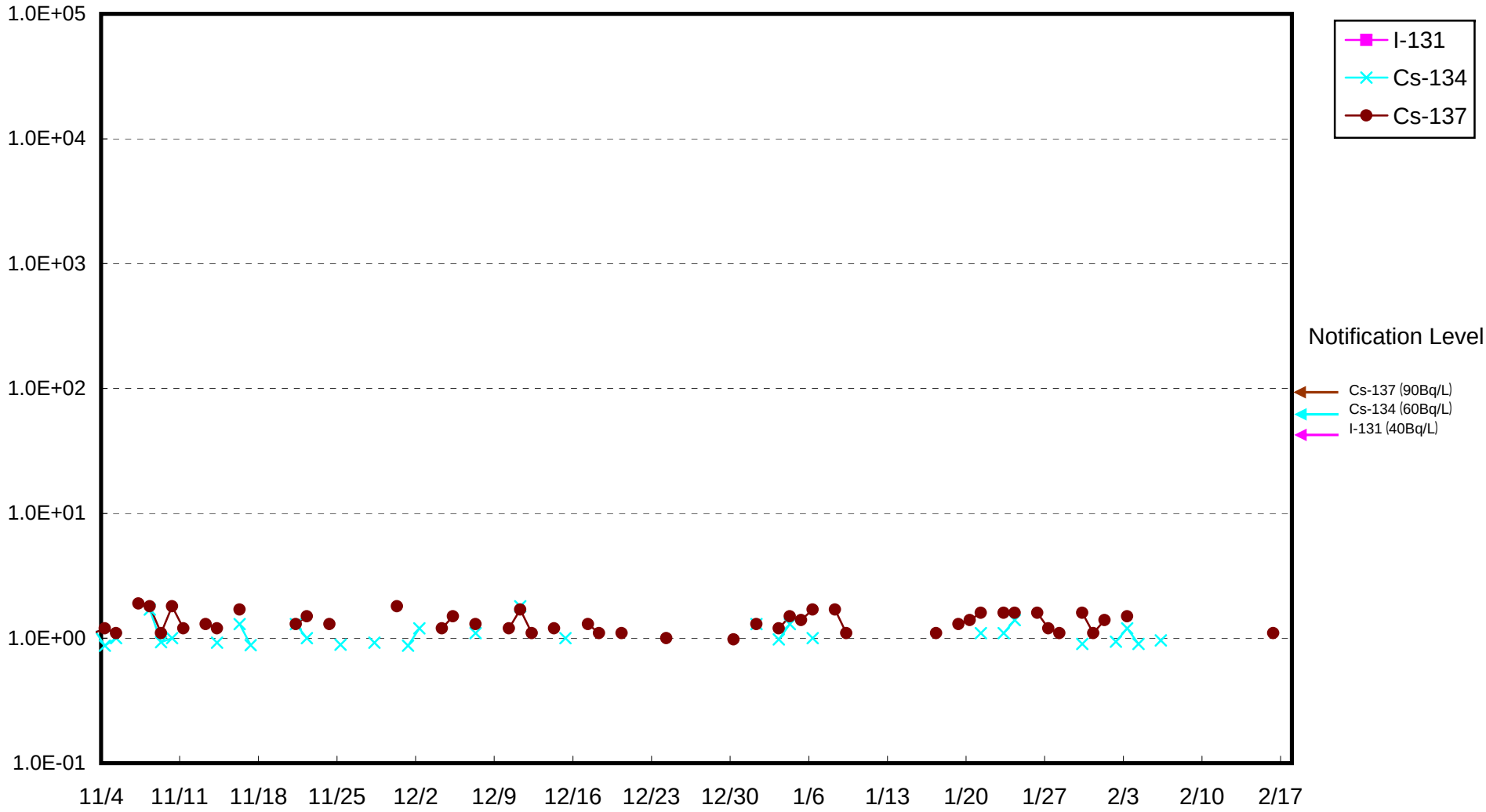
Radioactivity Density of Seawater at South Discharge Channel of 1F (Bq/L)



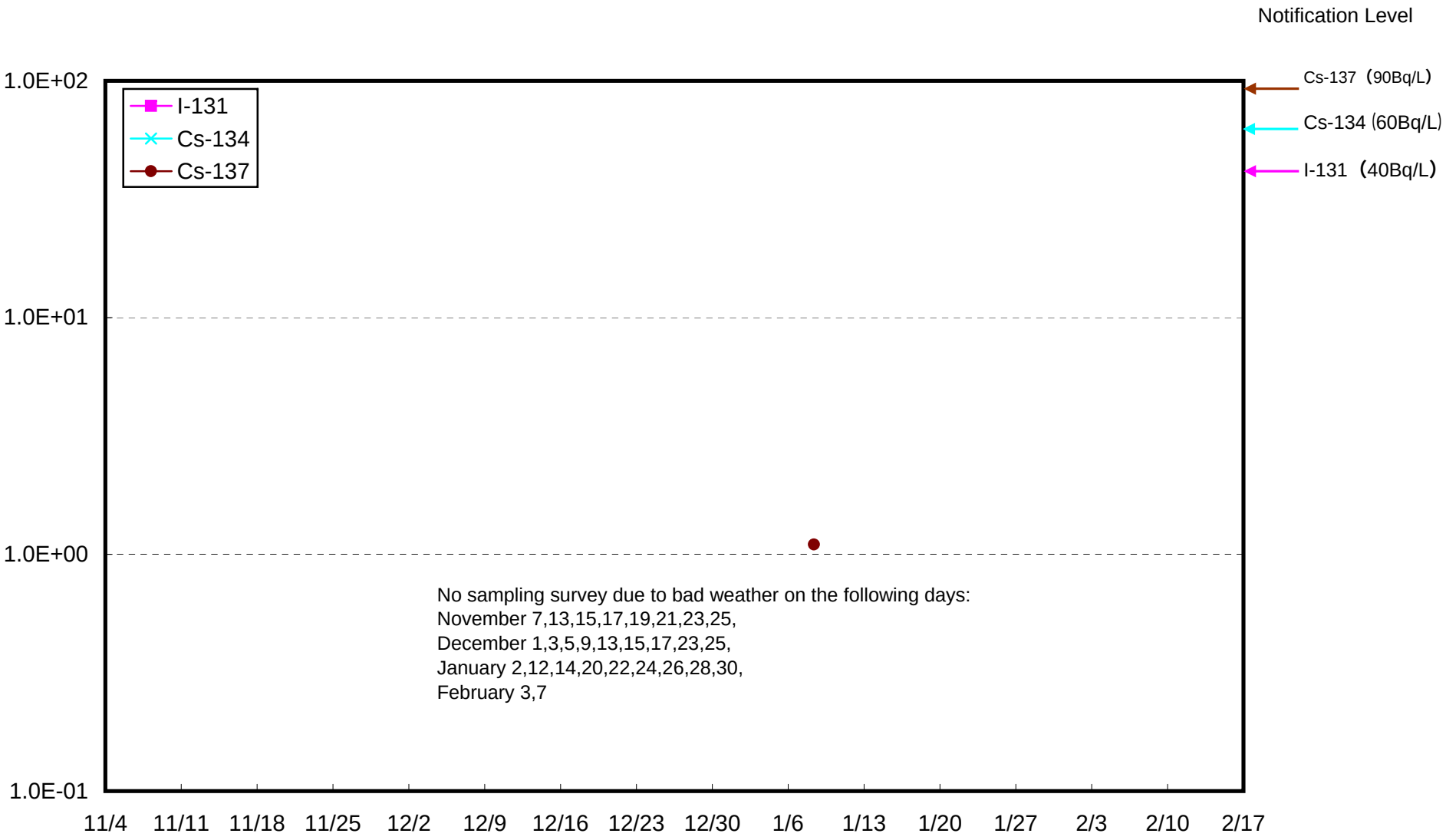
Radioactivity Density of Seawater at North Discharge Channel of 2F (Bq/L)



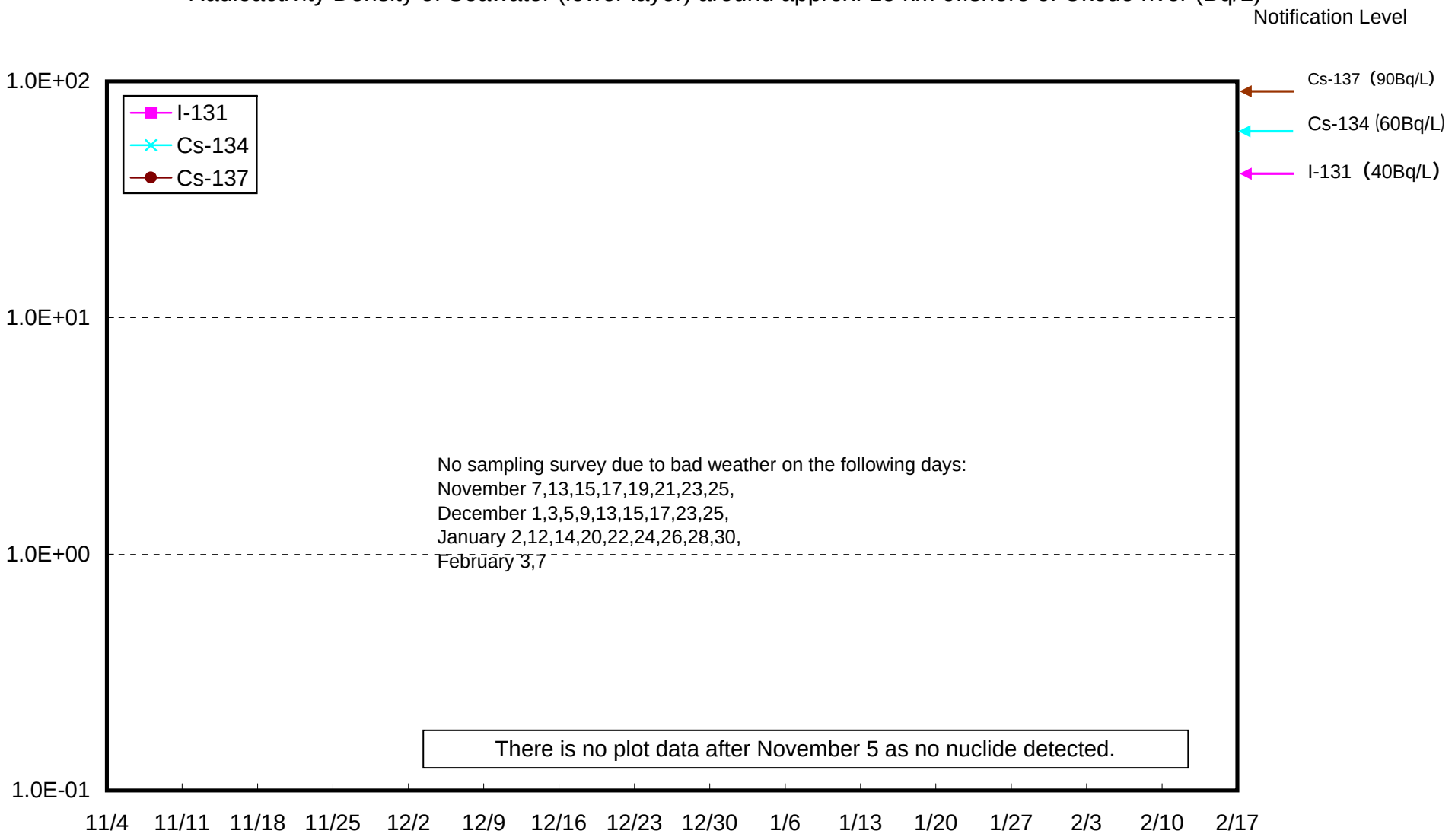
Radioactivity Density of Seawater at Iwasawa Shore 2F (Bq/L)



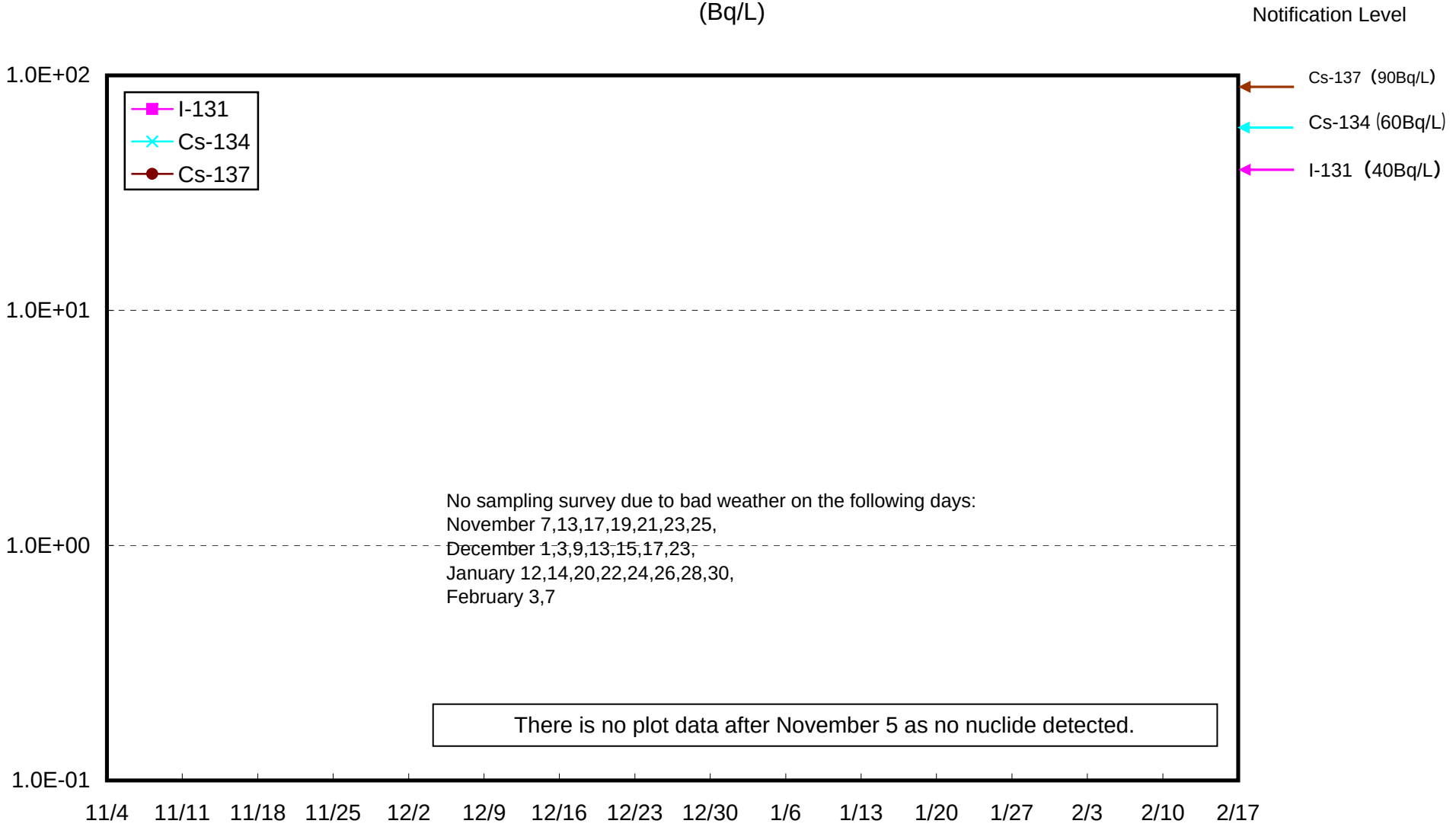
Radioactivity Density of Seawater (upper layer) around approx. 15 km offshore of Ukedo river (Bq/L)



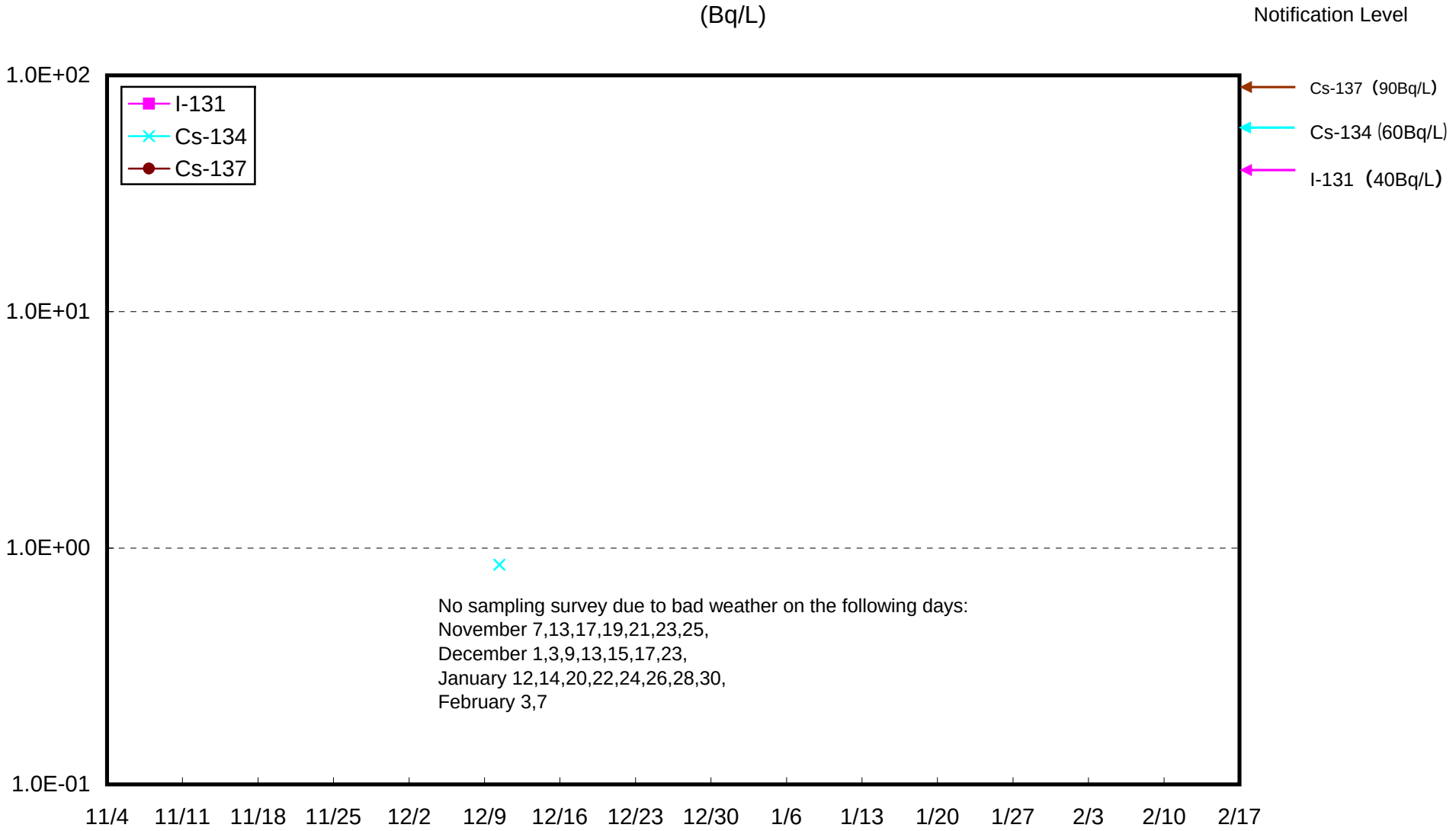
Radioactivity Density of Seawater (lower layer) around approx. 15 km offshore of Ukedo river (Bq/L)



Radioactivity Density of Seawater (upper layer) around approx. 15 km offshore of Fukushima Daiichi NPS

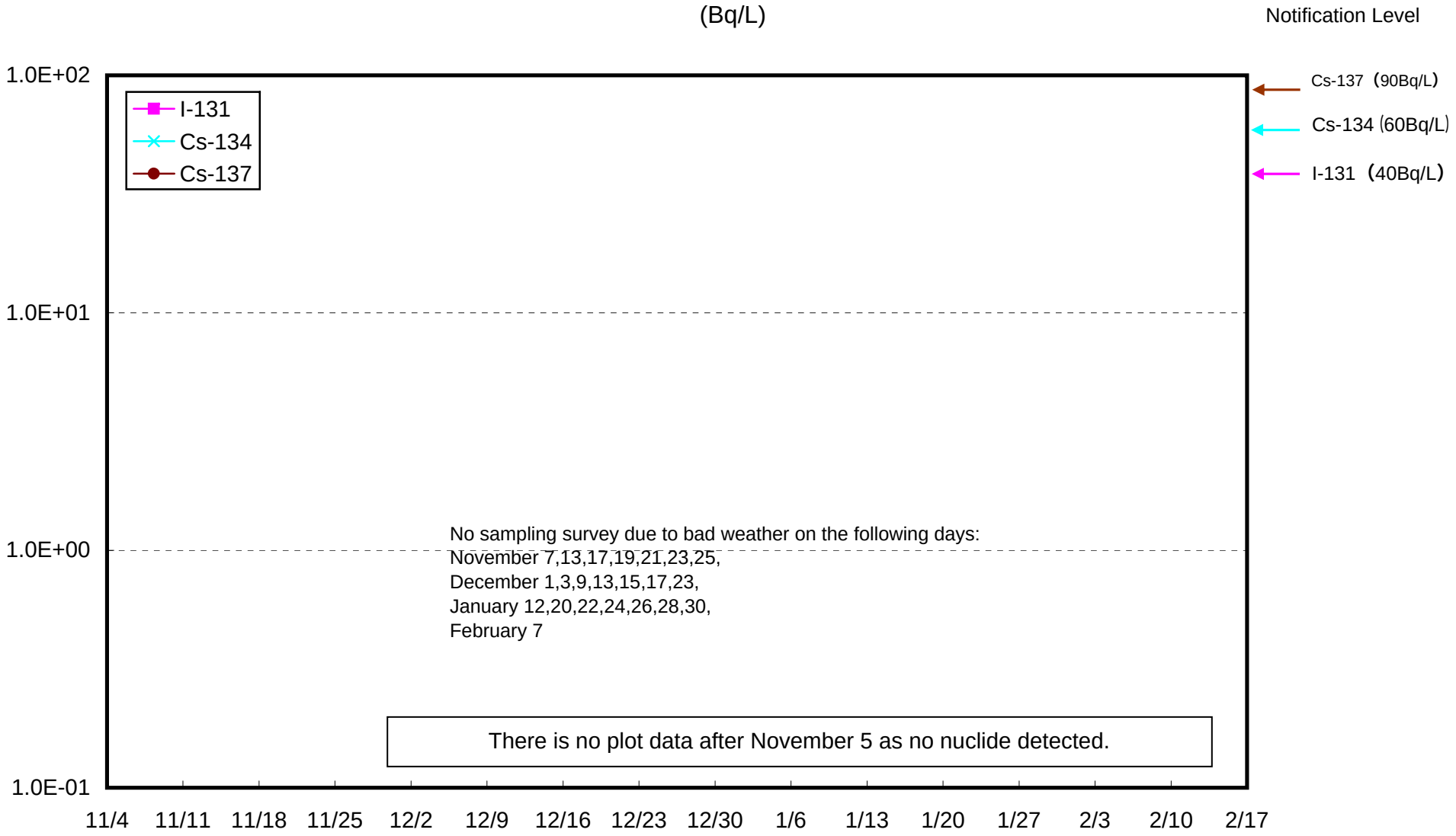


Radioactivity Density of Seawater (lower layer) around approx. 15 km offshore of Fukushima Daiichi NPS

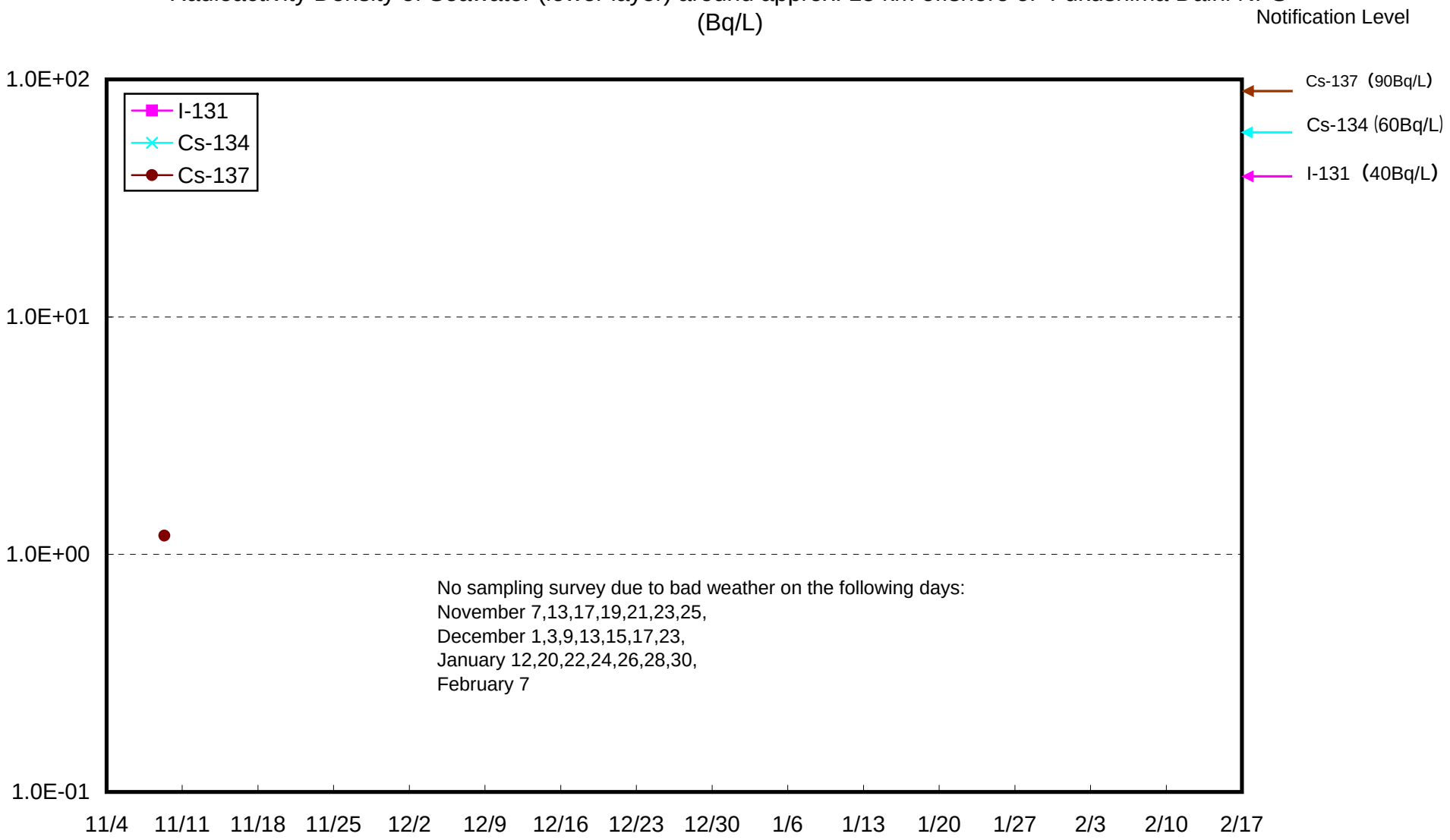


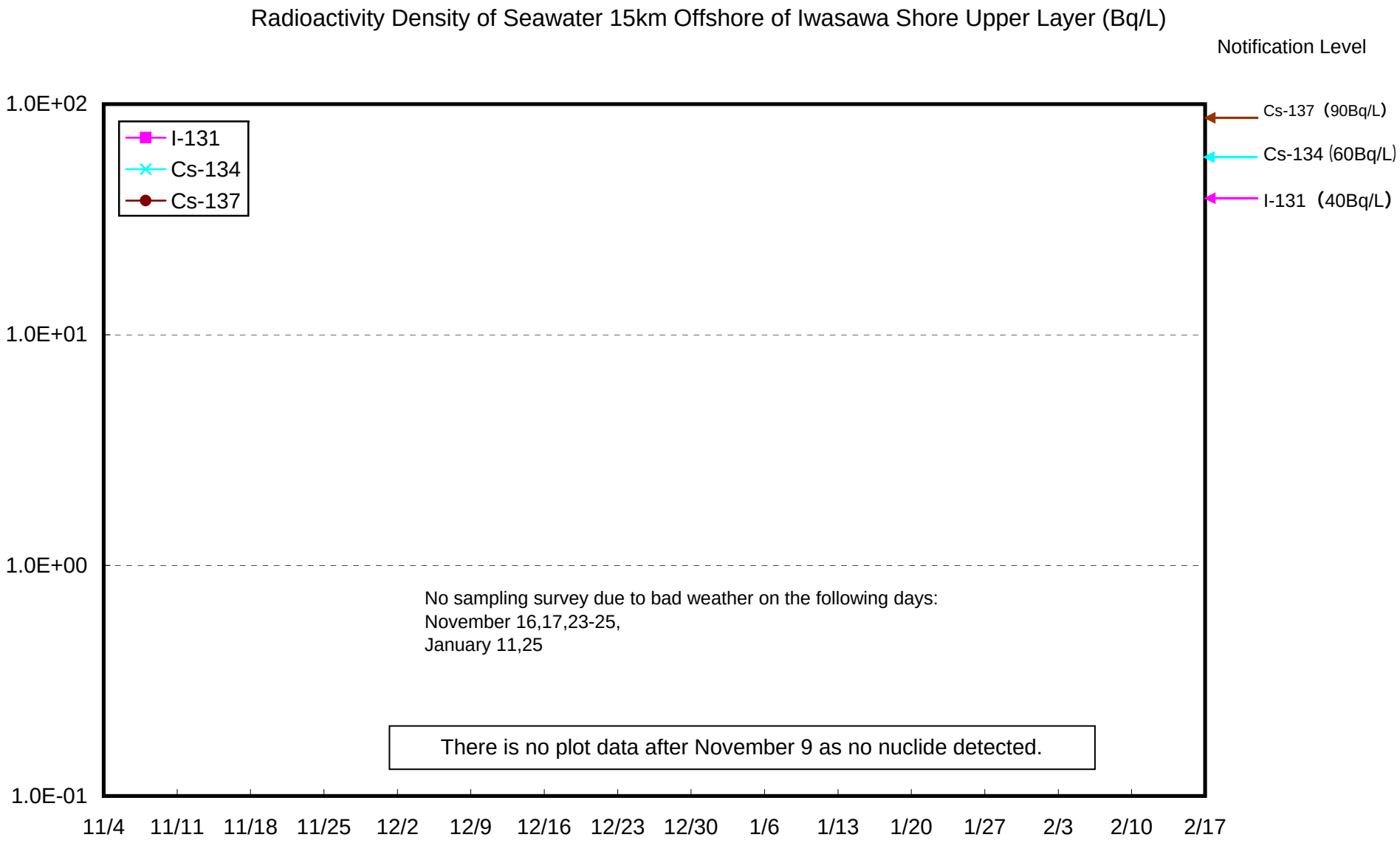
Radioactivity Density of Seawater (upper layer) around approx. 15 km offshore of Fukushima Daini NPS

(Bq/L)

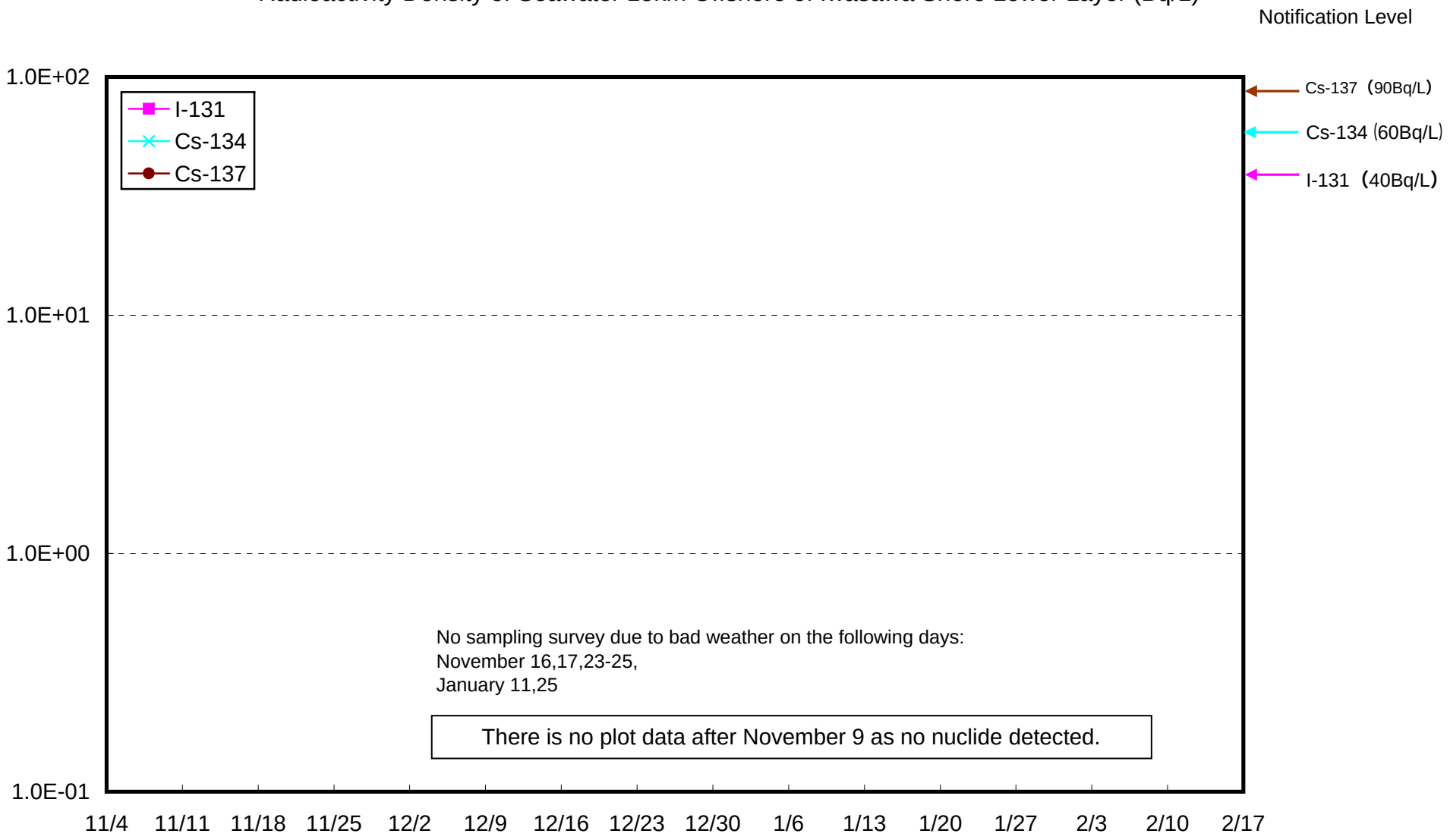


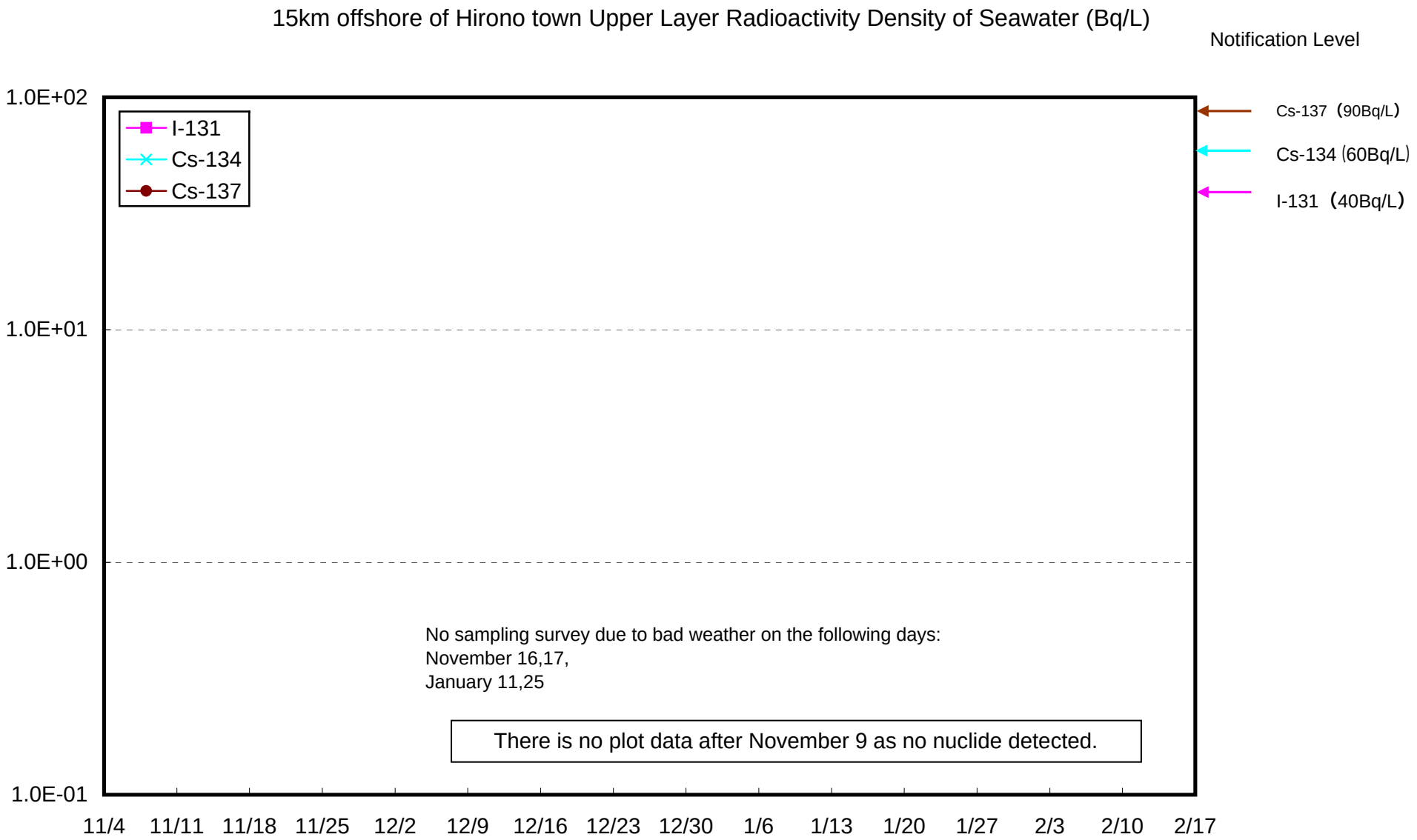
Radioactivity Density of Seawater (lower layer) around approx. 15 km offshore of Fukushima Daini NPS
(Bq/L)

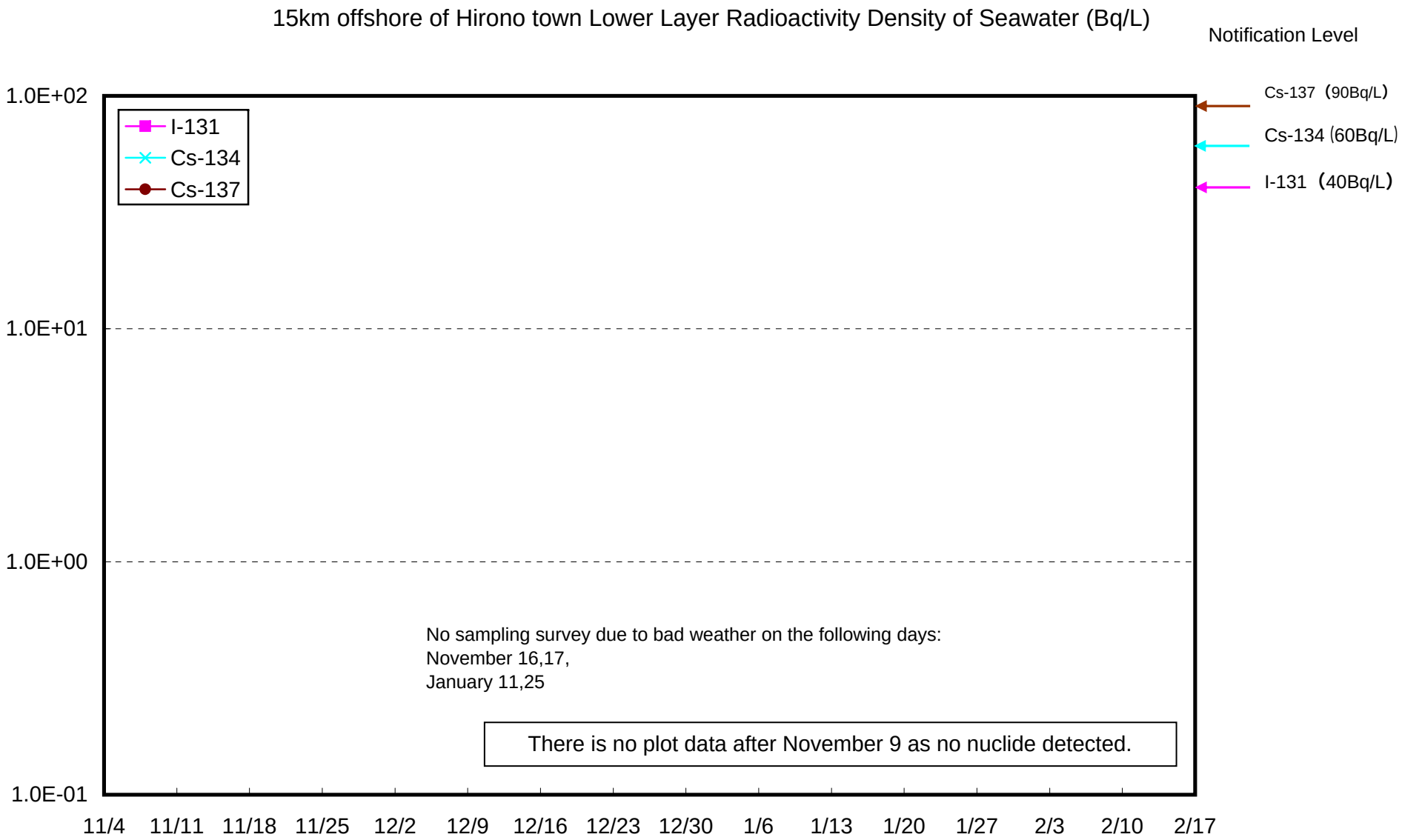



Radioactivity Density of Seawater 15km Offshore of Iwasawa Shore Upper Layer (Bq/L)
Notification Level
1.0E+02
1.0E+01
1.0E+00
1.0E-01
I-131
Cs-134
Cs-137
Cs-137（90Bq/L）
Cs-134（60Bq/L）
I-131（40Bq/L）
No sampling survey due to bad weather on the following days:
November 16,17,23-25,
January 11,25
There is no plot data after November 9 as no nuclide detected.
11/4
11/11
11/18
11/25
12/2
12/9
12/16
12/23
12/30
1/6
1/13
1/20
1/27
2/3
2/10
2/17

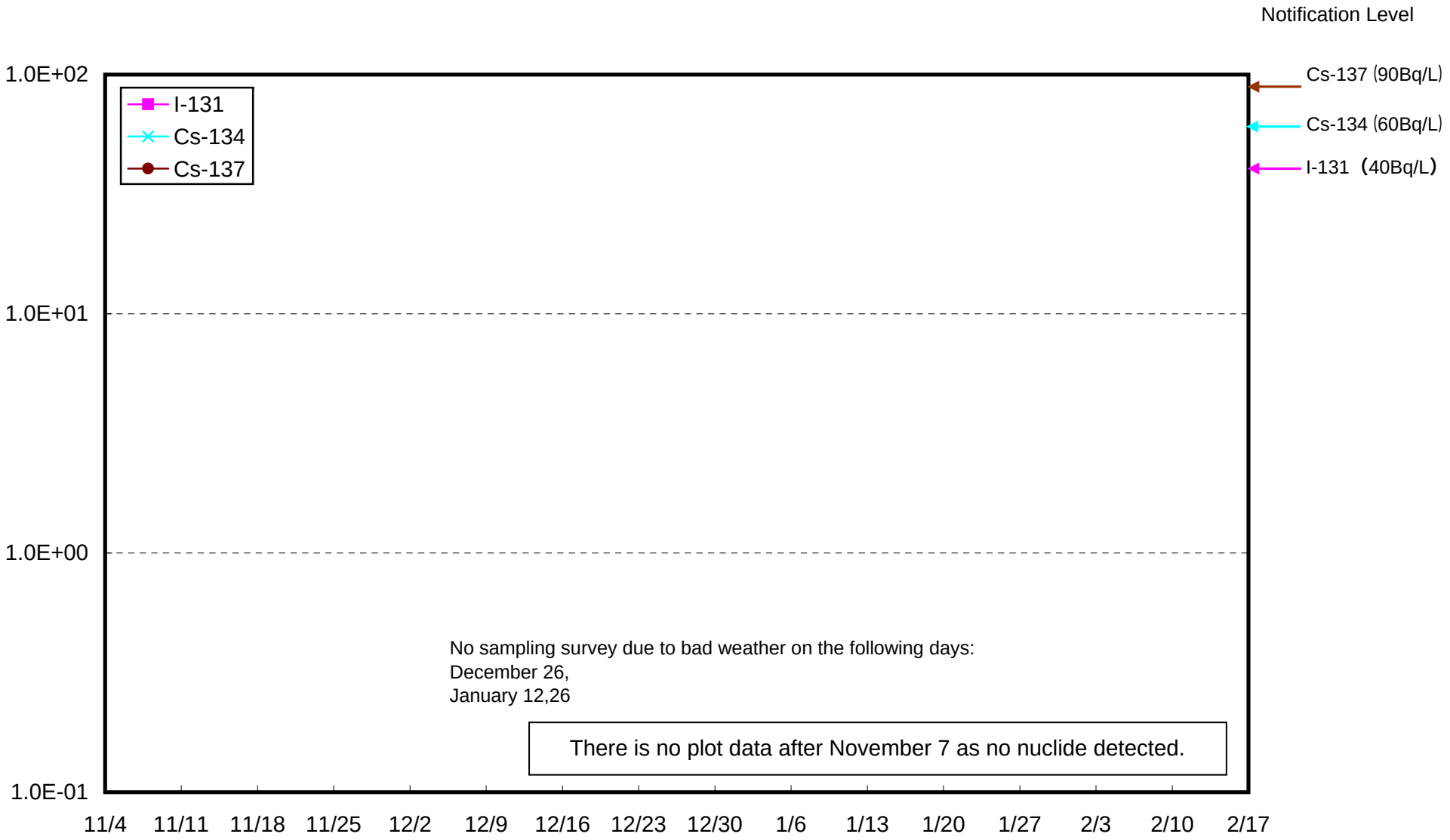
Radioactivity Density of Seawater 15km Offshore of Iwasawa Shore Lower Layer (Bq/L)

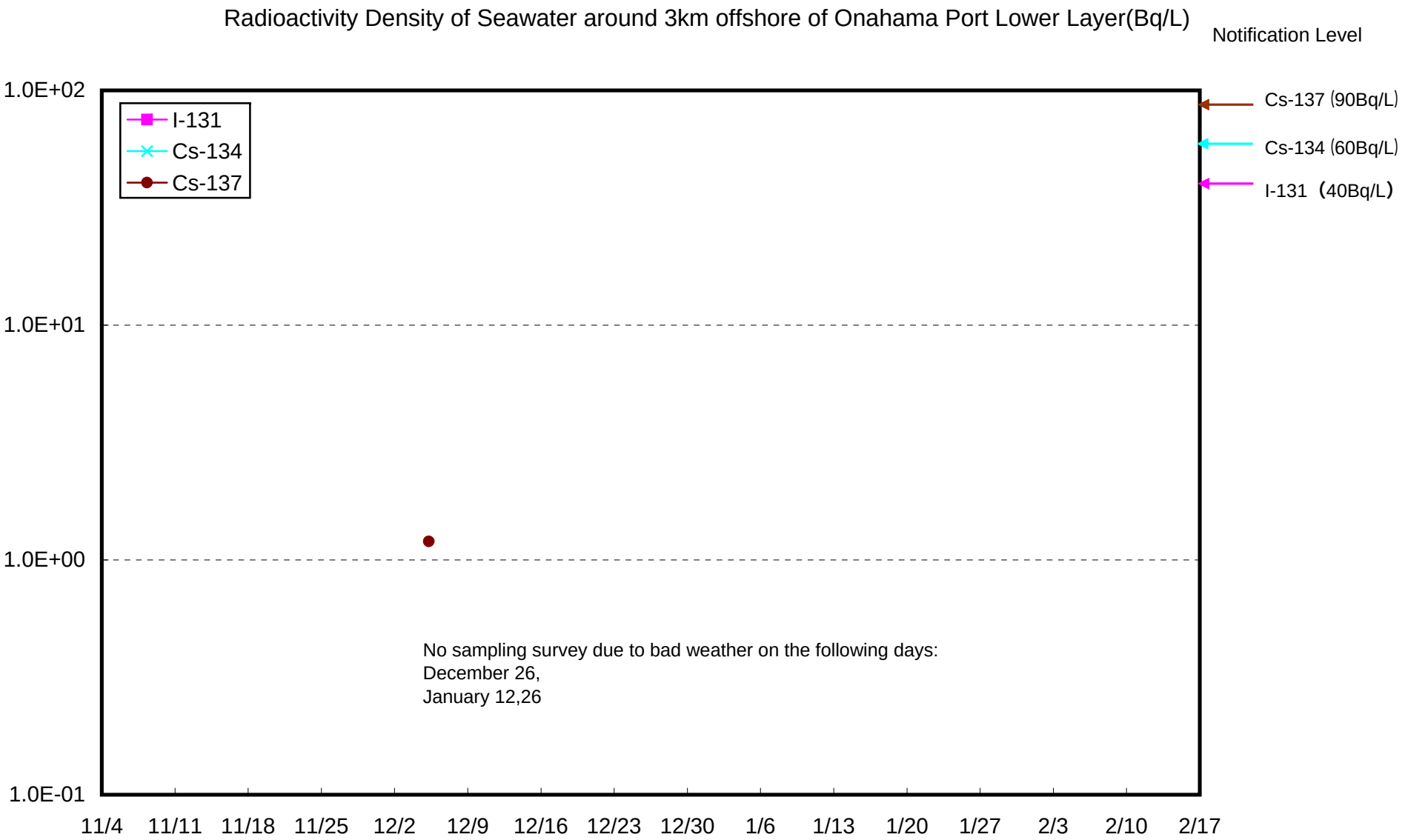


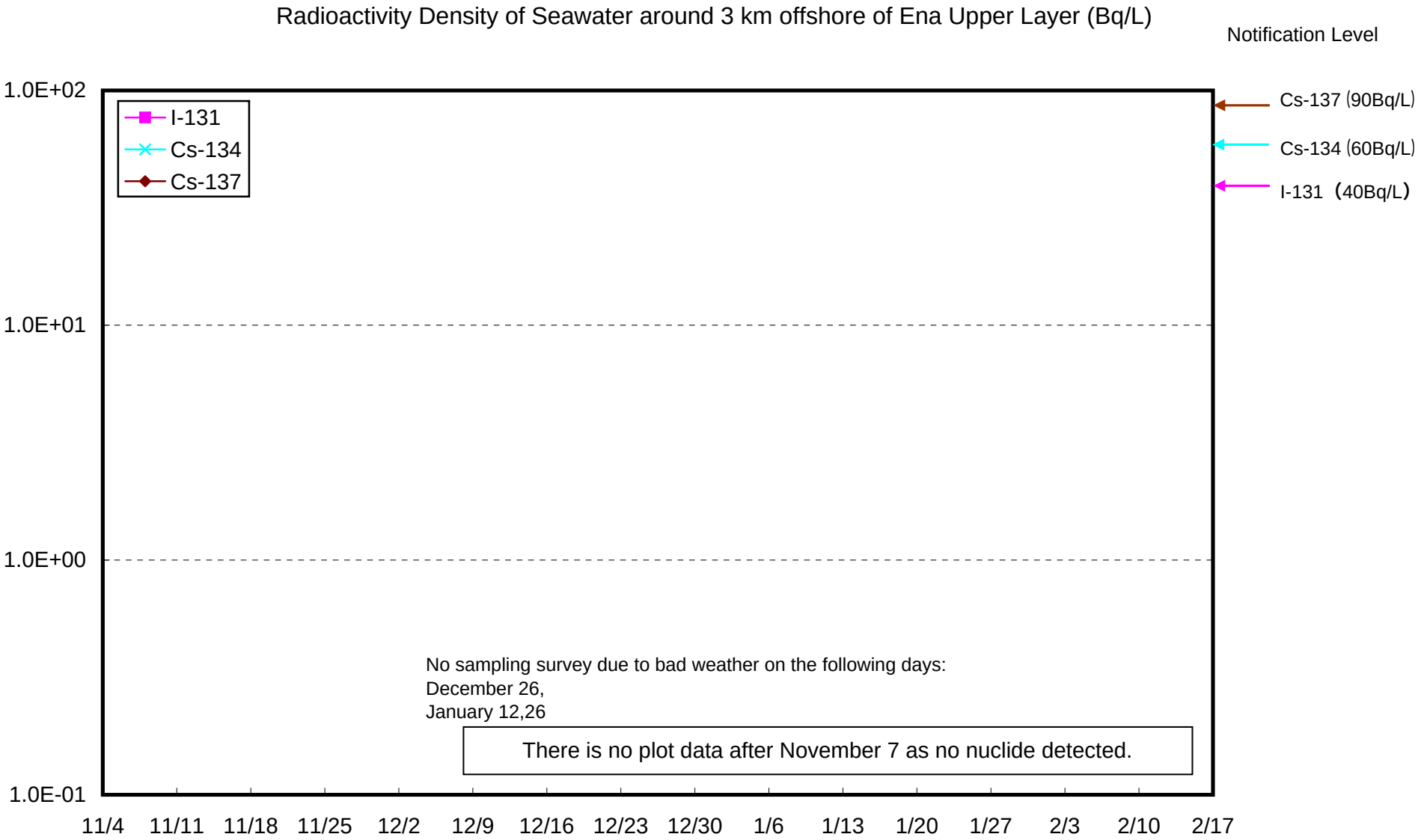

15km offshore of Hirono town Upper Layer Radioactivity Density of Seawater (Bq/L)
Notification Level
Cs-137（90Bq/L）
Cs-134（60Bq/L）
I-131（40Bq/L）
I-131
Cs-134
Cs-137
1.0E+02
1.0E+01
1.0E+00
1.0E-01
No sampling survey due to bad weather on the following days:
November 16,17,
January 11,25
There is no plot data after November 9 as no nuclide detected.
11/4
11/11
11/18
11/25
12/2
12/9
12/16
12/23
12/30
1/6
1/13
1/20
1/27
2/3
2/10
2/17


15km offshore of Hirono town Lower Layer Radioactivity Density of Seawater (Bq/L)
Notification Level
Cs-137（90Bq/L）
Cs-134（60Bq/L）
I-131（40Bq/L）
I-131
Cs-134
Cs-137
1.0E+02
1.0E+01
1.0E+00
1.0E-01
No sampling survey due to bad weather on the following days:
November 16,17,
January 11,25
There is no plot data after November 9 as no nuclide detected.
11/4
11/11
11/18
11/25
12/2
12/9
12/16
12/23
12/30
1/6
1/13
1/20
1/27
2/3
2/10
2/17

Radioactivity Density of Seawater around 3km offshore of Onahama Port Upper Layer(Bq/L)




Radioactivity Density of Seawater around 3km offshore of Onahama Port Lower Layer(Bq/L)
Notification Level
Cs-137 (90Bq/L)
Cs-134 (60Bq/L)
I-131 (40Bq/L)
I-131
Cs-134
Cs-137
1.0E+02
1.0E+01
1.0E+00
1.0E-01
No sampling survey due to bad weather on the following days:
December 26,
January 12,26
11/4
11/11
11/18
11/25
12/2
12/9
12/16
12/23
12/30
1/6
1/13
1/20
1/27
2/3
2/10
2/17


Radioactivity Density of Seawater around 3 km offshore of Ena Upper Layer (Bq/L)
Notification Level
Cs-137 (90Bq/L)
Cs-134 (60Bq/L)
I-131 (40Bq/L)
I-131
Cs-134
Cs-137
1.0E+02
1.0E+01
1.0E+00
1.0E-01
11/4
11/11
11/18
11/25
12/2
12/9
12/16
12/23
12/30
1/6
1/13
1/20
1/27
2/3
2/10
2/17
No sampling survey due to bad weather on the following days:
December 26,
January 12,26
There is no plot data after November 7 as no nuclide detected.

Radioactivity Density of Seawater around 3 km offshore of Ena Lower Layer (Bq/L)