Information(16:00), January 18, 2024

To All Missions (Embassies, Consular posts and International Organizations in Japan)

Report on the discharge record and the seawater monitoring results at Fukushima Daiichi Nuclear Power Station during December

The Ministry of Foreign Affairs wishes to provide all international Missions in Japan with a report on the discharge record and seawater monitoring results with regard to groundwater pumped from the sub-drain and groundwater drain systems, as well as, bypassing groundwater pumped during the month of December at Fukushima Daiichi Nuclear Power Station (NPS).

1. Summary of decommissioning and contaminated water management

In December the summary of monthly progress on decommissioning and contaminated water management of Fukushima Daiichi NPS was issued shown in Appendix 1. For more information, please see the following URL: https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/mp202312.pdf

2. Sub-drain and Groundwater Drain Systems

In December purified groundwater pumped from the sub-drain and groundwater drain systems was discharged on the dates shown in Appendix 2. Prior to every discharge, an analysis on the quality of the purified groundwater to be discharged was conducted by Tokyo Electric Power Company (TEPCO) and the results were announced.

All the test results during the month of December have confirmed that the radiation levels of sampled water were substantially below the operational targets set by TEPCO (these operational targets are well below the density limit specified by the Reactor Regulation). The results of these analyses were also confirmed by third-party organization (Tohoku Ryokka Kankyohozen Co.).

In addition, TEPCO and Japan Atomic Energy Agency (JAEA), at the request of the Government of Japan, regularly conduct more detailed analyses on the purified groundwater. The results of JAEA's latest analyses confirmed that TEPCO's analyses were accurate and verified that the radiation levels of sampled groundwater was substantially below the operational target (see Appendix 3).

Moreover, TEPCO publishes the results of analyses conducted on seawater sampled during the discharge operation at the nearest seawater sampling post from the discharge point (see Appendix 4). The results show that the radiation levels of seawater remain lower than the density limit specified by the Reactor Regulation and significant change in the radioactivity has not been observed.

3. Groundwater Bypassing

In December, the pumped bypassing groundwater was discharged on the dates shown in Appendix 5. Prior to every discharge, an analysis on the quality of the groundwater to be discharged was conducted by TEPCO and the results were announced.

All the test results during the month of December have confirmed that the radiation levels of sampled water were substantially below the operational targets set by TEPCO (these operational targets are well below the density limit specified by the Reactor Regulation). The results of these analyses were also confirmed by Japan Chemical Analysis Center.

In addition, TEPCO and JAEA, at the request of the Government of Japan, regularly conduct more detailed analyses on the groundwater. The results of JAEA's latest analyses confirmed that TEPCO's analyses were accurate and verified that the radiation levels of the sampled groundwater were substantially below the operational target (see Appendix 6).

Moreover, TEPCO publishes analysis results on seawater sampled during the discharge operation at the nearest seawater sampling post from the discharge point (see Appendix 7). The result shows that the radiation levels in seawater remain lower than the density limit specified by the Reactor Regulation and significant change in the radioactivity has not been observed. The analysis had been conducted once a month until March 2017. Since April 2017, it is conducted four times a year because there has been no significant fluctuation in the concentration of radioactive materials in the sea water, and no influence on the surrounding environment has been confirmed.

The sampling process for analyses conducted this month is the same as the one conducted in the information disseminated last month. Results of the analyses are shown in the attached appendices:

(For further information, please contact TEPCO at (Tel: 03-6373-1111) or refer to the TEPCO's website:
http://www.tepco.co.jp/en/nu/fukushima-np/handouts/index-e.html)

Contact: International Nuclear Energy Cooperation Division,
Ministry of Foreign Affairs, Tel 03-5501-8227

Outline of Decommissioning, Contaminated Water and Treated Water Management

December 21, 2023
Secretariat of the Team for Countermeasures for Decommissioning, Contaminated Water and Treated Water

Main decommissioning work and steps

Fuel removal from the spent fuel pool was completed in December 2014 at Unit 4 and on February 28, 2021 at Unit 3.
Work continues sequentially toward the start of fuel removal from Units 1 and 2 and debris (Note 1) retrieval from Units 1-3.

(Note 1) Fuel assemblies having melted through in the accident with nearby metal materials etc.

<Milestones in the Mid- and Long-Term Roadmap>

Units 1-6	Completion of fuel removal	Within 2031
Unit 1	Start of fuel removal	FY2027 - FY2028
Unit 2	Start of fuel removal	FY2024 - FY2026

Fuel Removal from SFP: Units 1 and 2 — Rubble removal etc. → Installation of fuel removal equipment → Fuel removal → Units 3 and 4 — Storage/ Transportation

First unit	Start of fuel debris retrieval
Unit 2	Within 2021 * Due to the spread of COVID-19, we have revised the plan to start from the second half of fiscal 2023 to improve safety and reliability.

Fuel Debris Retrieval: Units 1 and 3 / Unit 2 — Understanding the situation inside the PCV/Consideration of retrieval methods → Fuel debris retrieval → Storage/ Transportation

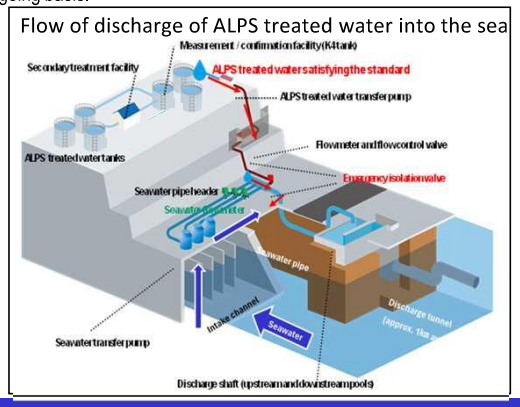
Dismantling Facilities: Scenario development & technology consideration → Design and manufacturing of devices/equipment → Dismantling

Measures for treated water

Appendix 1

Handling of ALPS treated water

Regarding the discharge of ALPS treated water into the sea, TEPCO must comply with regulatory and other safety standards to safeguard the public, the surrounding environment and agricultural, forestry and fishery products. To minimize adverse impacts on reputation, monitoring will be further enhanced and objectivity and transparency ensured by engaging with third-party experts and having safety checked by the IAEA. Moreover, accurate information will be disseminated with full transparency on an ongoing basis.



Contaminated water management - triple-pronged efforts -

(1) Efforts to promote contaminated water management based on the three basic policies

① "Remove" the source of water contamination ② "Redirect" fresh water from contaminated areas
③ "Retain" contaminated water from leakage

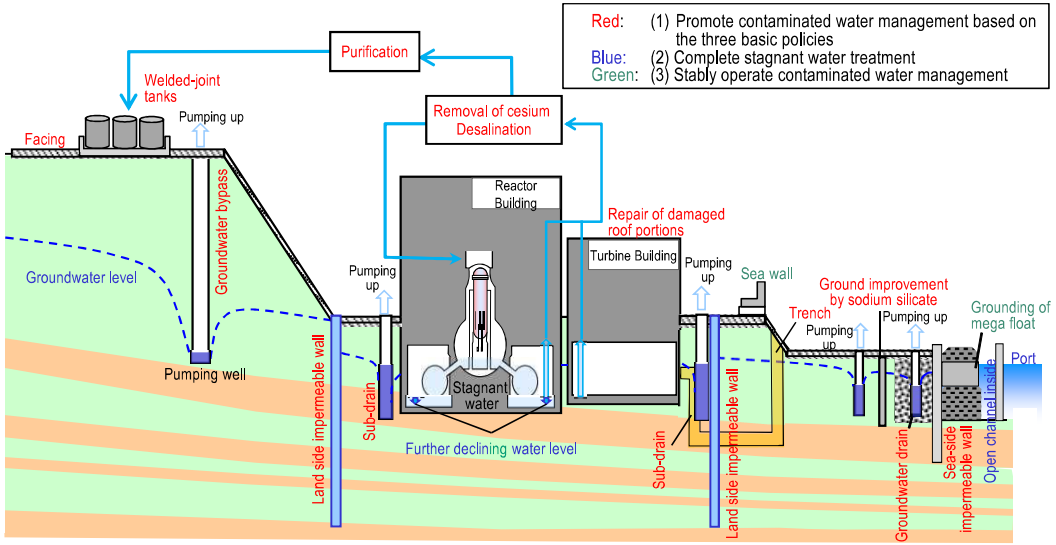
- Strontium-reduced water from other equipment is being re-treated in the Advanced Liquid Processing System (ALPS: multi-nuclide removal equipment) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and sub-drains, have stabilized the groundwater at a low level and the increased contaminated water generated during rainfall is being suppressed by repairing damaged portions of building roofs facing onsite. Through these measures, the generation of contaminated water was reduced from approx. 540 m^3/day (in May 2014) to approx. 90 m^3/day (in FY2022).
- Measures continue to further suppress the generation of contaminated water to 100 m^3/day or less within 2025.

(2) Efforts to complete stagnant water treatment

- To reduce the stagnant water levels in buildings as planned, work to install additional stagnant water transfer equipment is underway.
- In 2020, treatment of stagnant water in buildings was completed, except for the Unit 1-3 Reactor Buildings, Process Main Building and High-Temperature Incinerator Building.
- While assessing the dust impact, measures to reduce the stagnant water level were implemented. In March 2023, the target water level in each building was achieved. For the Units 1-3 Reactor Buildings, "reducing stagnant water in the Reactor Buildings to about half the amount at the end of 2020 during the period FY2022-2024" was achieved.
- For zeolite sandbags on the basement floors of the Process Main Building and High-Temperature Incinerator Building, measures to reduce the radiation dose are being examined with stabilization in mind.

(3) Efforts to stably operate contaminated water management

- Various measures were carried out to prepare for tsunamis. As countermeasures for heavy rain, sandbags are being installed to suppress direct inflow into buildings while work to close openings in buildings and install sea walls to enhance drainage channels and other measures are being implemented as planned.



Progress status

◆ The temperatures of the Reactor and the Primary Containment Vessel of Units 1-3 have been maintained stable.
There was no significant change in the concentration of radioactive materials newly released from Reactor Buildings into the air. It was concluded that the comprehensive cold shutdown condition had been maintained.

Review of discharge of ALPS treated water into the sea

In the sea area monitoring conducted by the national government, Fukushima Prefecture and TEPCO after the discharge of ALPS treated water into the sea (third discharge), no abnormality was detected. Moreover, for the Discharge Facility, an inspection was conducted to confirm no abnormality.

To validate the oceanic dispersion simulation used to assess the radiation environmental impact, the tritium dispersion calculation and seawater monitoring data during the 1st discharge period were compared. Assessment continues for the 2nd and 3rd discharge period for validation.

For the subsequent discharge volume of ALPS treated water, transportation to Tank Group B of the Measurement/ Confirmation Facility was completed on December 11. Following the circulation and stirring operation and once compliance with the discharge requirement has been confirmed, the 4th discharge will commence from late February 2024 onward.

Unit 1 PCV internal investigation (aerial survey)

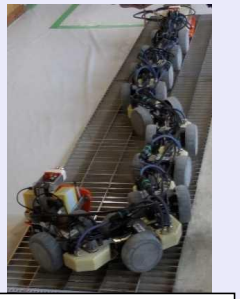
Toward fuel debris retrieval, in addition to information on the basement floor, the status of the entire PCV needs to be determined. Accordingly, an aerial survey will be conducted within this fiscal year mainly for the 1st floor area.

This survey, to be conducted within the dark and confined space inside the PCV, will use a small drone and snake-type robot.

The investigation will be conducted not only outside the pedestal but also around the bottom of the Reactor Pressure Vessel (RPV) inside the pedestal. The investigative results will be utilized to examine fuel debris retrieval methods and for future PCV and RPV internal investigations.

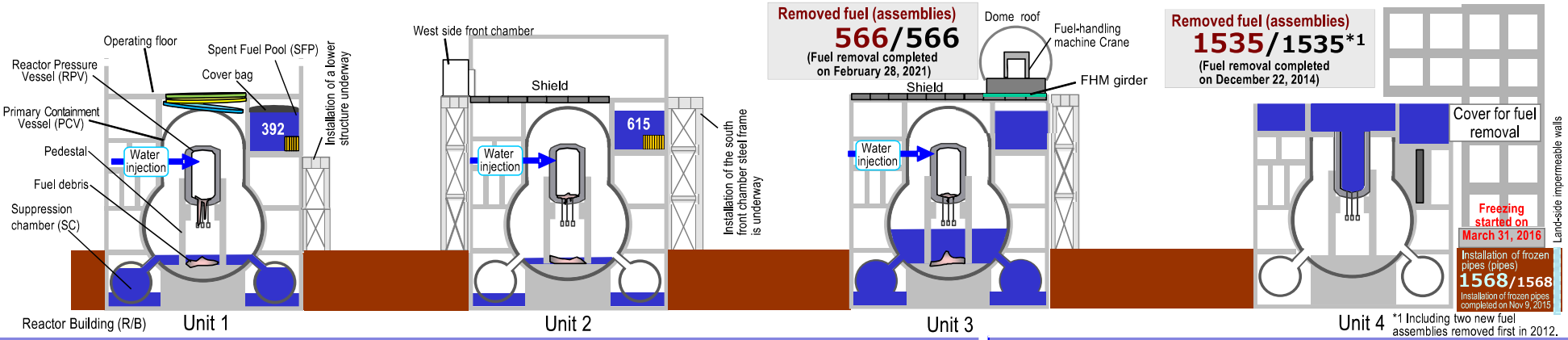
Size: approx. 19×18×5 [cm]
Weight: 185 [g] (including battery)

< Small drone >



Size: approx. 300×18×17 [cm]
Weight: approx. 25 [kg]

< Snake-type robot >



*1 Including two new fuel assemblies removed first in 2012.

Unit 2 Preparation status for trial retrieval

In the mockup facility in Naraha Town, based on the test status, efforts to resolve issues like improving work efficiency and increasing accuracy are being made so that the approx. robot arm can be used on the site. At present, tests for building access routes are underway.

On site, before removing deposits inside the X-6 penetration, from which the robot arm would be inserted into the PCV, installation of the deposit removal equipment was completed on December 14. Subsequently, installation of the spray equipment to X-53 penetration is underway.

Based on the status of deposit removal inside X-6 penetration and the test for the robot arm, which is to commence from early January, the process will be refined to ensure safe and careful trial retrieval.

< Transportation of deposit removal equipment >

Unit 3 Commencement of stagnant gas purge in S/C

In the Unit 3 Suppression Chamber (S/C), it is assumed that in addition to stagnant gas generated at the time of the accident, hydrogen gas generated by water radiolysis remains. To reduce any risk possibly leading to hydrogen combustion, stagnant gas inside the S/C will be purged.

Before the purge, gas was sampled via gas purge equipment and analyzed. Although krypton was detected, the exposure impact assessment on the site boundaries revealed that the risk of radiation exposure to the surrounding public would be minimal.

Based on this result, to confirm the impact on parameters of the Primary Containment Vessel (PCV), a small-scale purge commenced from December 19. While monitoring PCV parameters, no significant variation was detected. Work continues with safety first.

Appendix 2

Results of analyses on the quality of the purified groundwater pumped from the sub-drain and groundwater drain systems at Fukushima Daiichi NPS (made available by TEPCO prior to discharge)

(Unit: Bq/L)

Date of sampling *Date of discharge	Detected nuclides	Analytical body	
		TEPCO	Third-party organization
December 27th, 2023 *Discharged on January 1st	Cs-134	ND (0.77)	ND (0.60)
	Cs-137	ND (0.59)	ND (0.51)
	Gross β	ND (0.68)	0.42
	H-3	720	740
December 25th, 2023 *Discharged on December 30th	Cs-134	ND (0.69)	ND (0.53)
	Cs-137	ND (0.72)	ND (0.59)
	Gross β	ND (1.8)	ND (0.37)
	H-3	680	690
December23th, 2023 *Discharged on December 28th	Cs-134	ND (0.86)	ND (0.70)
	Cs-137	ND (0.65)	ND (0.67)
	Gross β	ND (1.8)	ND (0.46)
	H-3	630	660
December 21st, 2023 *Discharged on December 26th	Cs-134	ND (0.69)	ND (0.60)
	Cs-137	ND (0.65)	ND (0.67)
	Gross β	ND (0.66)	ND (0.42)
	H-3	830	850
December19th, 2023 *Discharged on December24th	Cs-134	ND (0.69)	ND (0.60)
	Cs-137	ND (0.61)	ND (0.62)
	Gross β	ND (1.9)	ND (0.37)
	H-3	810	830
December17th, 2023 *Discharged on December 22th	Cs-134	ND (0.69)	ND (0.58)
	Cs-137	ND (0.85)	ND (0.51)
	Gross β	ND (1.9)	ND (0.41)
	H-3	760	810
December15th, 2023 *Discharged on December 20th	Cs-134	ND (0.69)	ND (0.52)
	Cs-137	ND (0.45)	ND (0.61)
	Gross β	ND (0.64)	ND (0.37)
	H-3	720	750
December 13th, 2023 *Discharged on	Cs-134	ND (0.71)	ND (0.70)
	Cs-137	ND (0.71)	ND (0.54)

December 18h	Gross β	ND (1.8)	ND (0.33)
	H-3	780	820
December11th, 2023 *Discharged on December 16th	Cs-134	ND (0.75)	ND (0.36)
	Cs-137	ND (0.46)	ND (0.48)
	Gross β	ND (2.1)	ND (0.38)
	H-3	830	850
December9th, 2023 *Discharged on December14th	Cs-134	ND (0.63)	ND (0.65)
	Cs-137	ND (0.63)	ND (0.50)
	Gross β	ND (2.0)	ND (0.28)
	H-3	880	900
December7th, 2023 *Discharged on December12th	Cs-134	ND (0.75)	ND (0.56)
	Cs-137	ND (0.71)	ND (0.59)
	Gross β	ND (0.58)	ND (0.36)
	H-3	880	910
December5th, 2023 *Discharged on December10th	Cs-134	ND (0.55)	ND (0.60)
	Cs-137	ND (0.80)	ND (0.57)
	Gross β	ND (2.0)	ND (0.34)
	H-3	800	830
December 3rd, 2023 *Discharged on December8th	Cs-134	ND(0.80)	ND(0.65)
	Cs-137	ND(0.75)	ND(0.61)
	Gross β	ND(1.8)	ND(0.34)
	H-3	780	830
December1st, 2023 *Discharged on December6th	Cs-134	ND (0.75)	ND (0.52)
	Cs-137	ND (0.78)	ND (0.62)
	Gross β	ND (0.64)	ND (0.38)
	H-3	720	750
November29th, 2023 *Discharged on December4th	Cs-134	ND (0.75)	ND (0.65)
	Cs-137	ND (0.82)	ND (0.61)
	Gross β	ND (1.9)	ND(0.33)
	H-3	720	730
November27th, 2023 *Discharged on December2nd	Cs-134	ND (0.69)	ND (0.70)
	Cs-137	ND (0.85)	ND (0.51)
	Gross β	ND (1.9)	ND (0.36)
	H-3	680	710

- * ND: represents a value below the detection limit; values in ( ) represent the detection limit.
- In order to ensure the results, third-party organizations have also conducted an analysis and verified the radiation level of the sampled water.
- Third-party organization : Tohoku Ryokka Kankyohozen Co., Ltd

Appendix 3

Result of detailed analyses conducted by TEPCO, JAEA, and Japan Chemical Analysis Center (In order to confirm the validity of analysis, the Government of Japan also requests JAEA; and TEPCO requests Japan Chemical Analysis Center to conduct independent analyses)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Analytical body		
		JAEA	TEPCO	Japan Chemical Analysis Center
November1st,2023	Cs-134	ND (0.0022)	ND (0.0050)	ND (0.0065)
	Cs-137	0.0022	ND(0.0036)	ND (0.0053)
	Gross α	ND (0.37)	ND (2.3)	ND (2.1)
	Gross β	ND (0.47)	ND (0.64)	ND (0.52)
	H-3	810	810	840
	Sr-90	0.0030	ND (0.0078)	ND(0.0072)

* ND: represents a value below the detection limit; values in ( ) represent the detection limit.

(Reference) (Unit: Bq/L)

Radionuclides	Operational Targets	Density Limit specified by the Reactor Regulation	World Health Organization (WHO) Guidelines for Drinking Water Quality
Cs-134	1	60	10
Cs-137	1	90	10
Gross α	—	—	—
Gross β	3 (1) ※	—	—
H-3	1,500	60,000	10,000
Sr-90	—	30	10

※ The operational target of Gross β is 1 Bq/L in the survey which is conducted once every ten days.

※ The reference table shows the values of operational targets before discharge. Since the values after discharge contain natural radioactive materials in seawater, there will be differences between the values and the operational targets values.

Appendix 4

Results of analysis on the seawater sampled near the discharge point (North side of Units 5 and 6 discharge channel)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Sampling point (South discharge channel)
December21st, 2023 *Sampled before discharge of purified groundwater.	Cs-134	ND (0.75)
	Cs-137	ND (0.70)
	Gross β	12.0
	H-3	ND (0.37)

Appendix 5

Results of analyses on the water quality of the groundwater pumped up for bypassing at Fukushima Daiichi NPS (made available by TEPCO prior to discharge)

(Unit: Bq/L)

Date of sampling *Date of discharge	Detected nuclides	Analytical body	
		TEPCO	Third-party organization
December23th, 2023 *Discharged on December 28th	Cs-134	ND (0.69)	ND (0.75)
	Cs-137	ND (0.90)	ND (0.61)
	Gross β	ND (0.65)	ND (0.33)
	H-3	43	49
December16th, 2023 *Discharged on December 21st	Cs-134	ND (0.77)	ND (0.63)
	Cs-137	ND (0.65)	ND (0.70)
	Gross β	ND (0.59)	ND (0.29)
	H-3	44	54
December 7th, 2023 *Discharged on December 12th	Cs-134	ND (0.61)	ND (0.67)
	Cs-137	ND (0.70)	ND (0.67)
	Gross β	ND (0.57)	ND (0.34)
	H-3	44	49
November 29th, 2023 *Discharged on December4th	Cs-134	ND (0.80)	ND (0.63)
	Cs-137	ND (0.72)	ND (0.72)
	Gross β	ND (0.66)	ND (0.33)
	H-3	48	47

- * ND: represents a value below the detection limit; values in ( ) represent the detection limit
- In order to ensure the results, third-party organizations have also conducted an analysis and verified the radiation level of the sampled water.
- Third-party organization: Tohoku Ryokka Kankyohozen Co., Ltd

Result of detailed analyses conducted by TEPCO, JAEA, and Japan Chemical Analysis Center (In order to confirm the validity of analysis, the Government of Japan also requests JAEA; and TEPCO requests Japan Chemical Analysis Center to conduct independent analyses)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Analytical body		
		JAEA	TEPCO	Japan Chemical Analysis Center
November 2nd, 2023	Cs-134	ND (0.0038)	ND (0.0047)	ND (0.0065)
	Cs-137	ND (0.0019)	ND (0.0053)	ND (0.0042)
	Gross α	ND (0.44)	ND (2.0)	ND (2.1)
	Gross β	ND (0.47)	ND (0.67)	ND (0.60)
	H-3	49	49	51
	Sr-90	ND(0.0013)	ND (0.0013)	ND (0.0061)

* ND: represents a value below the detection limit; values in ( ) represent the detection limit.

(Reference) (Unit: Bq/L)

Radionuclides	Operational Targets	Density Limit specified by the Reactor Regulation	World Health Organization (WHO) Guidelines for Drinking Water Quality
Cs-134	1	60	10
Cs-137	1	90	10
Gross α	—	—	—
Gross β	5 (1) ※	—	—
H-3	1,500	60,000	10,000
Sr-90	—	30	10

※ The operational target of Gross β is 1 Bq/L in the survey which is conducted once every ten days.

※ The reference table shows the values of operational targets before discharge. Since the values after discharge contain natural radioactive materials in seawater, there will be differences between the values and the operational targets values.

Appendix 7

Results of analyses on the seawater sampled near the discharge point (Around South Discharge Channel)

(Unit: Bq/L)

Date of sampling ※conducted four times a year	Detected nuclides	Sampling point (South discharge channel)
December 12th, 2023	Cs-134	ND (0.80)
	Cs-137	ND (0.72)
	Gross β	10
	H-3	ND (0.32)