Information (17:00), July 29, 2021

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 June

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 June at Fukushima Daiichi Nuclear Power Station (NPS).

1. Summary of decommissioning and contaminated water management

In June, 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/mp202106.pdf

2. Sub-drain and Groundwater Drain Systems

In June, 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 June 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.

2. Groundwater Bypassing

In June, 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 June 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 Cooperation Division,
Ministry of Foreign Affairs, Tel 03-5501-8227

Outline of Decommissioning and Contaminated Water Management

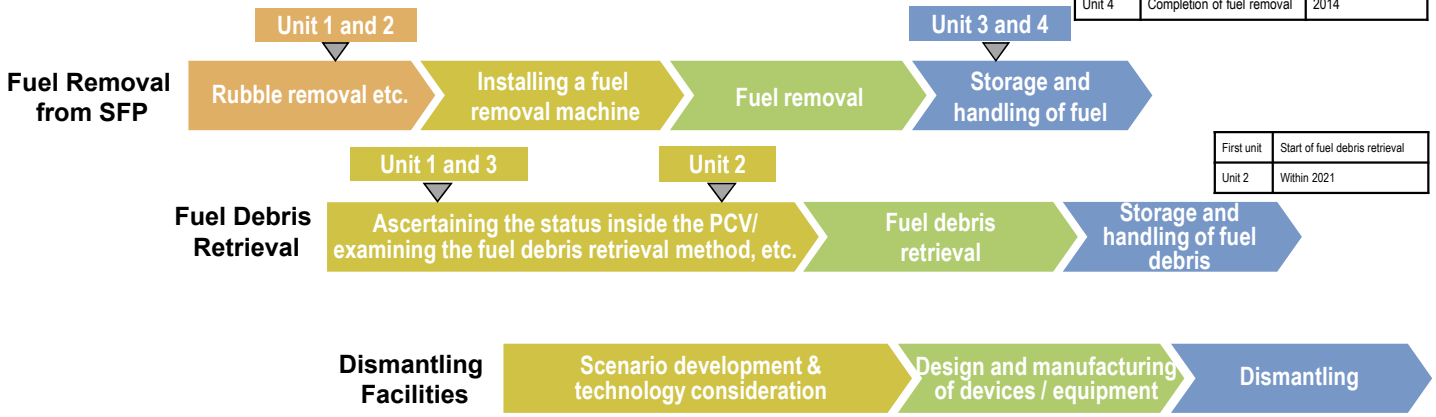
June 24, 2021
Secretariat of the Team for Countermeasures for Decommissioning and Contaminated Water Treatment

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.

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
Unit 3	Completion of fuel removal	Within FY2020
Unit 4	Completion of fuel removal	2014



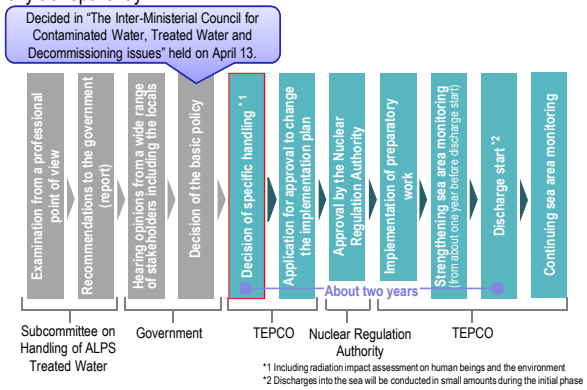
First unit	Start of fuel debris retrieval
Unit 2	Within 2021

Measures of 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, objectivity and transparency ensured by engaging with third-party experts and safety checked by the IAEA. Moreover, accurate information will be disseminated continuously and fully transparently.



*1 Including radiation impact assessment on human beings and the environment
*2 Discharges into the sea will be conducted in small amounts during the initial phase

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

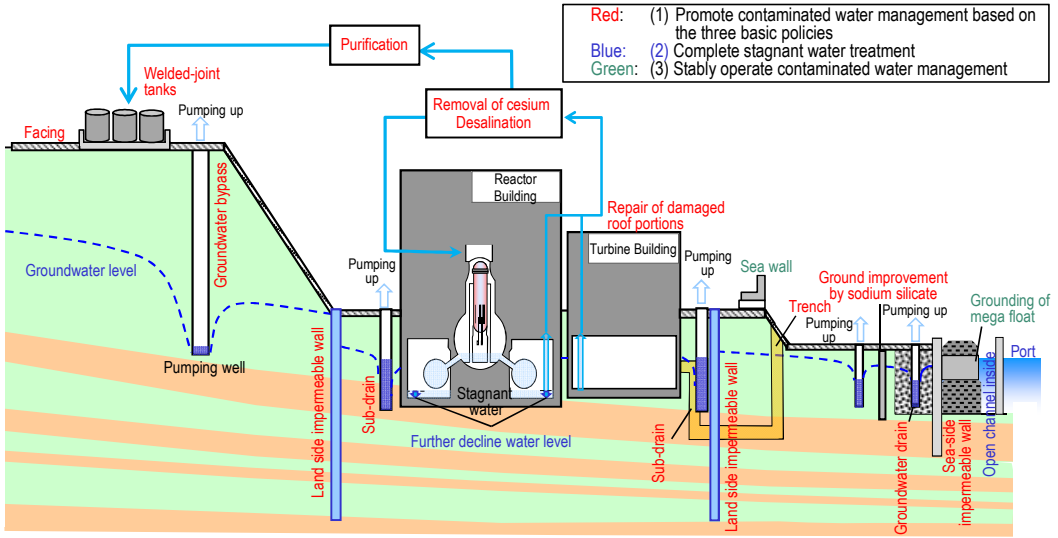
- Strontium-reduced water from other equipment is being re-treated in the multi-nuclide removal equipment (ALPS) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and sub-drains, have stabilized the groundwater at a low level and the increased contaminated water generated during rainfall is being suppressed by repairing damaged portions of building roofs, facing onsite, etc. Through these measures, the generation of contaminated water was reduced from approx. 540 m^3/day (in May 2014) to approx. 180 m^3/day (in FY2019) and approx. 140 m^3/day (in 2020).
- Measures continue to further suppress the generation of contaminated water to 100 m3/day or less within 2025.

(2) Efforts to complete stagnant water treatment

- To lower the stagnant water levels in buildings as planned, work to install additional stagnant water transfer equipment is underway. At present, the floor surface exposure condition can be maintained except for the Unit 1-3 Reactor Buildings, Process Main Building and the High Temperature Incinerator Building.
- 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. For Reactor Buildings, the amount of stagnant water there will be reduced to about half of the amount at the end of 2020 during the period FY2022-2024.
- 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

- To prepare for tsunamis, various measures are underway. For heavy rain, sandbags are being installed to suppress direct inflow into buildings while work closing building openings and installing sea walls to enhance drainage channels and other measures are being implemented as planned.



Progress Status and Future Challenges of the Mid-and-Long-Term Roadmap toward Decommissioning of TEPCO Holdings Fukushima Daiichi Nuclear Power Station (Outline)

Progress status

◆ The temperatures of the Reactor Pressure Vessel (RPV) and Primary Containment Vessel (PCV) of Units 1-3 have been maintained within the range of approx. 20-30°C*1 over the past month.
There was no significant change in the concentration of radioactive materials newly released from Reactor Buildings into the air*2. It was concluded that the comprehensive cold shutdown condition had been maintained.

* 1 The values varied somewhat, depending on the unit and location of the thermometer.
* 2 In May 2021, the radiation exposure dose due to the release of radioactive materials from the Unit 1-4 Reactor Buildings was evaluated at less than 0.00003 mSv/year at the site boundary.
The annual radiation dose from natural radiation is approx. 2.1 mSv/year (average in Japan).

Toward treatment of zeolite sandbags, an investigation by a boat-type ROV acquired information on dose distribution and sandbag location

Toward treatment of zeolite sandbags, the basement floor of the High Temperature Incinerator Building was investigated.

The investigative results showed that the dose distributed over the work area surface was within the range approx. 40-180 mSv/h. The significantly lower dose compared to the sandbag surface (approx. 4,400 mSv/h) is considered attributable to water shielding.

The location and status of the sandbags confirmed in this investigation will be utilized in examining future collection methods.

<Zeolite sandbags confirmed>

Third-party analysis of the ALPS treated water secondary treatment performance verification test implemented

For the secondary treatment performance verification test having been implemented since last year, third-party analysis after secondary treatment of the high concentration tank area (J1-C) was completed.

It was confirmed that the sum of ratios of concentrations required by law for 62 nuclides, which must be removed by ALPS and C-14 (0.28) was less than 1, as also confirmed by the analytical result (0.35) by TEPCO HD.

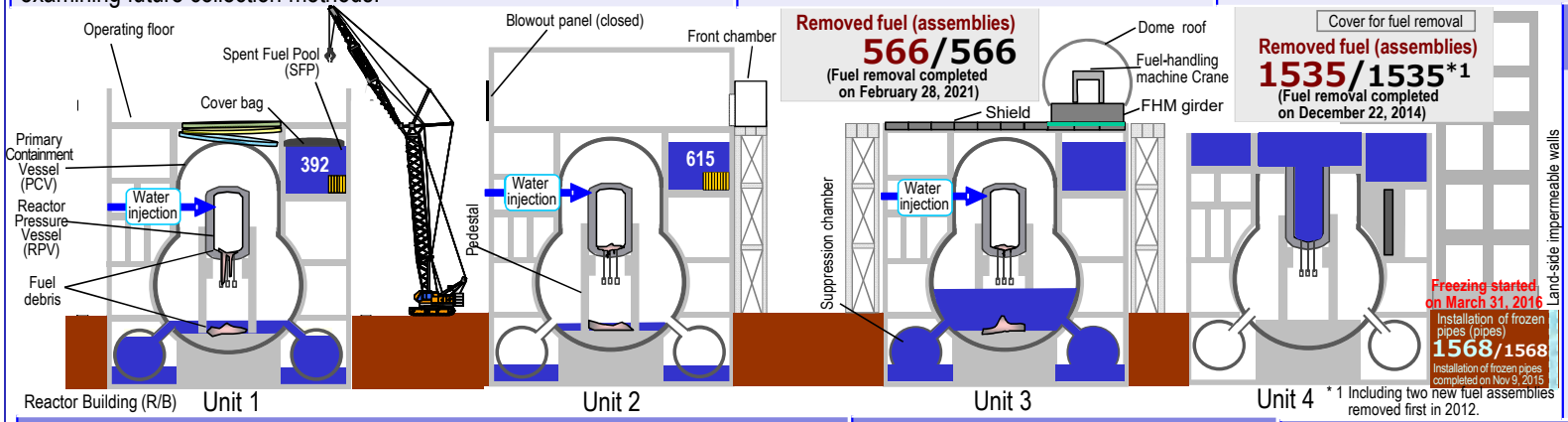
As this test involved a wait to obtain the analytical result, the nuclide analysis procedures and processes will be refined.

Prior to installing the Unit 1 large cover, dismantling of a building cover hindrance completed

To install a large cover over the Reactor Building, dismantling of the building cover (remaining part) hindrance started from December 19, 2020 and was completed on June19 as originally planned.

Following the dismantling, work to prepare a work yard around the building, assemble a temporary gantry in a yard outside the site and others are underway.

Toward completing the installation of the large cover in FY2023, work proceeds according to a plan.



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

Inspection of containers underway with enhanced monitoring

Regarding the appearance inspection of rubble containers with a high surface dose (0.1-30 mSv/h), 3,246 of 5,338 units were completed as of June 21.

From July, investigation of containers whose contents are not identified will get underway.

During the investigation, monitoring will be enhanced to ensure no leakage of radioactive materials, such as measuring dosage in drainage routes.

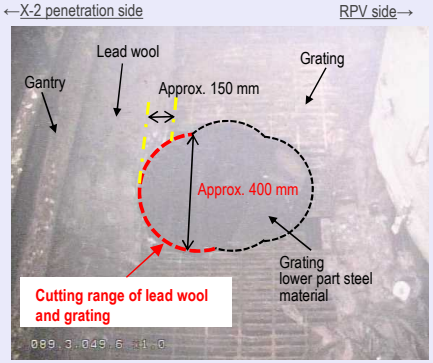
Inspection of containers will continue safely and according to plan.

Prior to the Unit 1 PCV internal investigation, construction of the access route resumed

An access route will be created before investigating inside the Unit 1 Primary Containment Vessel (PCV). Obstacles were investigated, the route to insert an underwater ROV was decided and obstacle cutting work by AWJ (drilling machine) was resumed.

On June 18, work to cut lead wool mat and the grating was completed.

The work carefully proceeds with safety first, by monitoring the PCV pressure and dust concentration.



<Cutting of lead wool and grating>

For the trial retrieval equipment of Unit 2 fuel debris, a verification test in the UK completed

For the trial retrieval equipment (robot arm) of fuel debris, an operation test and assembly verification test with the enclosure, which were implemented in the UK based on the infection status of COVID-19 and immigration restrictions, were completed.

Following the completion, the robot arm will be transported to Japan to have its performance verified and mockup.

Toward trial retrieval of fuel debris, preparation will continue.

To formulate an inspection plan to continuously verify seismic safety, the condition inside the Unit 3 Reactor Building investigated

Regarding the Unit 1-3 Reactor Buildings, sufficient seismic safety was confirmed at present through analysis and others.

Building conditions will be investigated to continuously verify the seismic safety.

To formulate an inspection plan, the condition inside the Unit 3 building was investigated.

Following Unit 3, the condition inside the Unit 1 and 2 buildings will be investigated in and around autumn 2021.

At the same time, based on the results obtained in this investigation, unmanned and personnel-saving investigations will also be examined.


<investigation inside the building>

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
June 25th, 2021 *Discharged on June 30th	Cs-134	ND (0.78)	ND (0.54)
	Cs-137	ND (0.77)	ND (0.51)
	Gross β	ND (2.0)	ND (0.38)
	H-3	830	860
June 24th, 2021 *Discharged on June 29th	Cs-134	ND (0.76)	ND (0.48)
	Cs-137	ND (0.65)	ND (0.63)
	Gross β	ND (1.9)	ND (0.36)
	H-3	920	930
June 21st, 2021 *Discharged on June 26th	Cs-134	ND (0.72)	ND (0.62)
	Cs-137	ND (0.75)	ND (0.61)
	Gross β	ND (1.8)	ND (0.37)
	H-3	980	1,000
June 20th, 2021 *Discharged on June 25th	Cs-134	ND (0.53)	ND (0.57)
	Cs-137	ND (0.60)	ND (0.63)
	Gross β	ND (1.7)	ND (0.33)
	H-3	920	960
June 18th, 2021 *Discharged on June 23rd	Cs-134	ND (0.85)	ND (0.75)
	Cs-137	ND (0.60)	ND (0.72)
	Gross β	0.68	0.39
	H-3	980	1,000
June 17th, 2021 *Discharged on June 22nd	Cs-134	ND (0.60)	ND (0.74)
	Cs-137	ND (0.54)	ND (0.67)
	Gross β	ND (2.1)	0.43
	H-3	890	890
June 16th, 2021 *Discharged on June 21st	Cs-134	ND (0.76)	ND (0.80)
	Cs-137	ND (0.65)	ND (0.67)
	Gross β	ND (1.9)	ND (0.38)
	H-3	960	990
June 13th, 2021 *Discharged on June 18th	Cs-134	ND (0.59)	ND (0.55)
	Cs-137	ND (0.73)	ND (0.54)
	Gross β	ND (1.7)	0.46
	H-3	870	880

June 12th, 2021 *Discharged on June 17th	Cs-134	ND (0.66)	ND (0.41)
	Cs-137	ND (0.77)	ND (0.63)
	Gross β	ND (1.9)	0.42
	H-3	870	880
June 11th, 2021 *Discharged on June 16th	Cs-134	ND (0.68)	ND (0.50)
	Cs-137	ND (0.60)	ND (0.69)
	Gross β	ND (1.8)	ND (0.36)
	H-3	740	770
June 10th, 2021 *Discharged on June 15th	Cs-134	ND (0.76)	ND (0.44)
	Cs-137	ND (0.60)	ND (0.76)
	Gross β	ND (0.58)	ND (0.40)
	H-3	800	830
June 7th, 2021 *Discharged on June 12th	Cs-134	ND (0.45)	ND (0.67)
	Cs-137	ND (0.54)	ND (0.54)
	Gross β	ND (1.9)	ND (0.33)
	H-3	930	950
June 6th, 2021 *Discharged on June 11th	Cs-134	ND (0.76)	ND (0.58)
	Cs-137	ND (0.65)	ND (0.54)
	Gross β	ND (1.8)	0.35
	H-3	910	950
June 4th, 2021 *Discharged on June 9th	Cs-134	ND (0.72)	ND (0.67)
	Cs-137	ND (0.54)	ND (0.51)
	Gross β	ND (1.7)	ND (0.34)
	H-3	910	950
June 3rd, 2021 *Discharged on June 8th	Cs-134	ND (0.57)	ND (0.69)
	Cs-137	ND (0.60)	ND (0.67)
	Gross β	ND (2.0)	ND (0.38)
	H-3	870	900
June 2nd, 2021 *Discharged on June 7th	Cs-134	ND (0.53)	ND (0.85)
	Cs-137	ND (0.60)	ND (0.77)
	Gross β	ND (1.6)	ND (0.36)
	H-3	850	860
June 1st, 2021 *Discharged on June 6th	Cs-134	ND (0.61)	ND (0.63)
	Cs-137	ND (0.60)	ND (0.81)
	Gross β	ND (0.65)	ND (0.35)
	H-3	890	910
May 30th, 2021 *Discharged on June 4th	Cs-134	ND (0.68)	ND (0.43)
	Cs-137	ND (0.73)	ND (0.66)
	Gross β	ND (1.8)	ND (0.32)
	H-3	990	1,000

May 29th, 2021 *Discharged on June 3rd	Cs-134	ND (0.69)	ND (0.63)
	Cs-137	ND (0.54)	ND (0.67)
	Gross β	ND (1.9)	ND (0.32)
	H-3	920	940
May 27th, 2021 *Discharged on June 1st	Cs-134	ND (0.41)	ND (0.62)
	Cs-137	ND (0.47)	ND (0.61)
	Gross β	ND (0.68)	ND (0.33)
	H-3	800	820

* * 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
May 2nd,2021	Cs-134	ND (0.0028)	ND (0.0044)	ND (0.0066)
	Cs-137	0.012	0.016	0.014
	Gross α	ND (0.49)	ND (3.0)	ND (1.9)
	Gross β	ND (0.38)	ND (0.58)	ND (0.50)
	H-3	1,100	1,100	1,100
	Sr-90	0.0016	ND (0.0012)	ND (0.0055)

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

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)
June 17th, 2021 *Sampled before discharge of purified groundwater.	Cs-134	ND (0.78)
	Cs-137	ND (0.60)
	Gross β	11
	H-3	ND (1.5)

(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.

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	Japan Chemical Analysis Center
June 16th, 2021 *Discharged on June 24th	Cs-134	ND (0.55)	ND (0.56)
	Cs-137	ND (0.80)	ND (0.56)
	Gross β	ND (0.61)	ND (0.59)
	H-3	64	60
June 9th, 2021 *Discharged on June 17th	Cs-134	ND (0.41)	ND (0.51)
	Cs-137	ND (0.89)	ND (0.39)
	Gross β	ND (0.67)	ND (0.54)
	H-3	63	71
June 2nd, 2021 *Discharged on June 10th	Cs-134	ND (0.58)	ND (0.62)
	Cs-137	ND (0.65)	ND (0.47)
	Gross β	ND (0.64)	ND (0.59)
	H-3	64	71
May 26th, 2021 *Discharged on June 3rd	Cs-134	ND (0.69)	ND (0.53)
	Cs-137	ND (0.67)	ND (0.49)
	Gross β	ND (0.63)	ND (0.55)
	H-3	67	64

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

∗ In order to ensure the results, Japan Chemical Analysis Center, a third-party organization, has also conducted an analysis and verified the radiation level of the sampled water.

Appendix 6

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
May 5th, 2021	Cs-134	ND (0.0024)	ND (0.0038)	ND (0.0075)
	Cs-137	ND (0.0021)	ND (0.0041)	ND (0.0050)
	Gross α	ND (0.42)	ND (3.0)	ND (1.9)
	Gross β	ND (0.38)	ND (0.71)	ND (0.57)
	H-3	81	81	82
	Sr-90	ND (0.0012)	ND (0.0012)	ND (0.0054)

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

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)
June 24th, 2021	Cs-134	ND (0.85)
	Cs-137	ND (0.70)
	Gross β	12
	H-3	5.9

(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.