Information (17:00), June 24, 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 May

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 May at Fukushima Daiichi Nuclear Power Station (NPS).

1. Summary of decommissioning and contaminated water management

In May, 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/mp202105.pdf

2. Sub-drain and Groundwater Drain Systems

In May, 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 May 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 May, 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 May 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

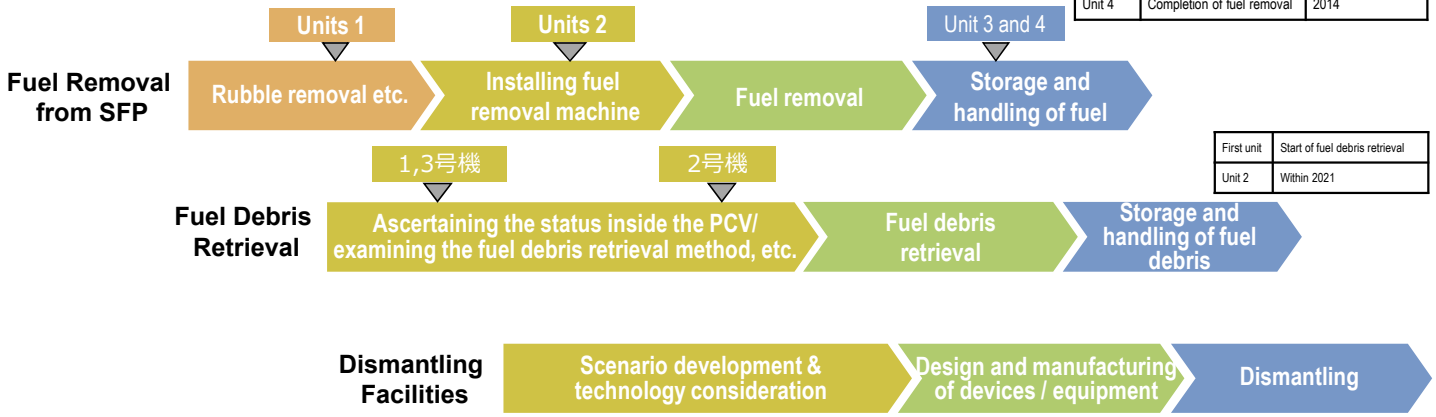
May 27, 2021
Secretariat of the Team for Countermeasures for Decommissioning and Contaminated Water Treatment

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



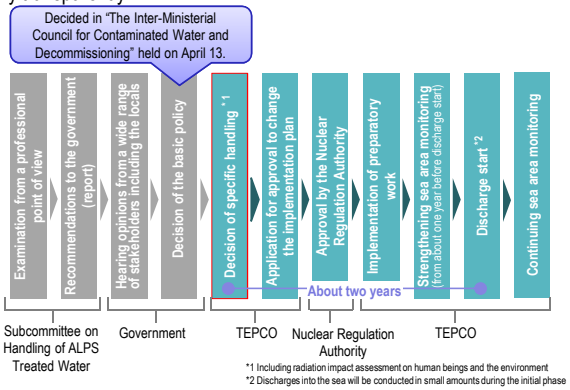
First unit	Start of fuel debris retrieval
Unit 2	Within 2021

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, 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 safety will be 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

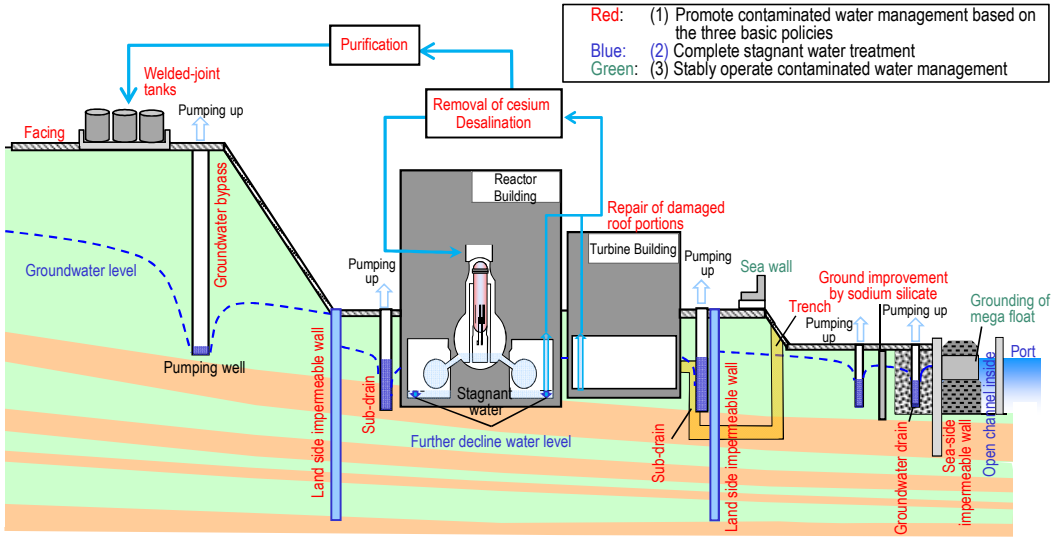
- Strontium-reduced water from other equipment is being re-treated in the multi-nuclide removal equipment (ALPS) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and sub-drains, have stabilized the groundwater at a low level 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. 15-25°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 March 2021, the radiation exposure dose due to the release of radioactive materials from the Unit 1-4 Reactor Buildings was evaluated at less than 0.00004 mSv/year at the site boundary.
The annual radiation dose from natural radiation is approx. 2.1 mSv/year (average in Japan).

Design concerning the facilities necessary to measure and evaluate radioactivity concentration before discharging ALPS treated water being examined

Regarding the discharge of ALPS treated water into the sea, its radioactivity concentration will be measured before dilution and discharge. It will be confirmed, including by a third party, that the sum of ratios of legally required concentrations of 62 nuclides (which must be removed by ALPS) and C-14 is less than 1.

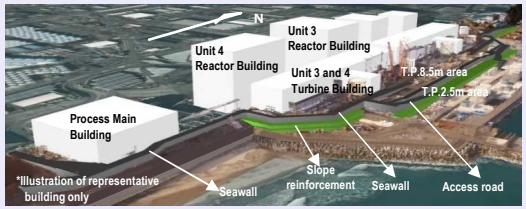
It will take some time to measure and evaluate the radioactivity concentration before discharge for some nuclides. To ensure smooth measurement, the three roles of tank areas (receiving, measuring and evaluating, and discharging) will be operated in rotation.

Furthermore, new technological trends related to tritium separation will be continuously monitored. From May 27, investigation and proposals related to such technologies started to be accepted through a new scheme, including a third-party organization.

Toward installing the Japan Trench Tsunami Seawall, construction will start from mid-June 2021

To prepare for an imminent emergency of the Japan Trench tsunami, which was announced by the Cabinet Office in April 2020, construction to install the "Japan Trench Tsunami Seawall" will start from around mid-June 2021.

Toward early reduction of the tsunami risk, work will proceed with safety first to complete the construction by the second half of FY2023.



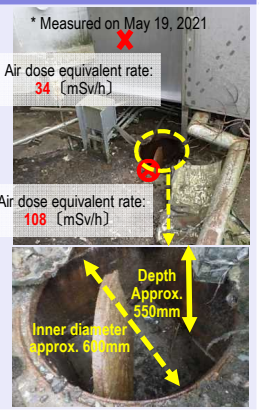
Investigation on a manhole from which rainwater was considered to flow into the Unit 1/2 exhaust stack drain sump pit

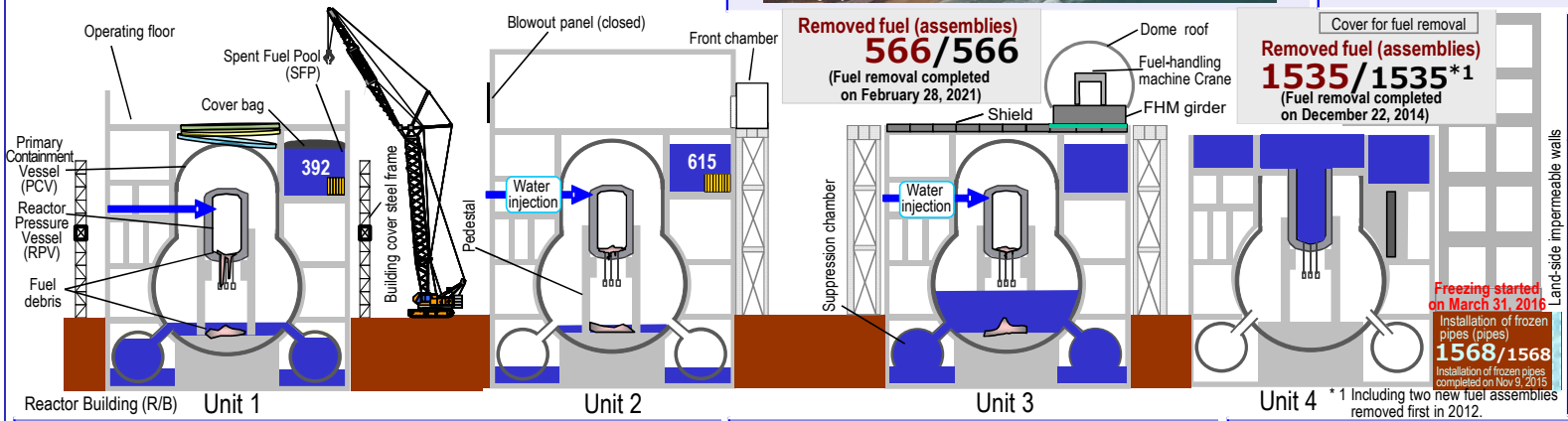
Despite measures to prevent rainfall inflow into the drain sump pit of the Unit 1/2 exhaust stack, the water level inside the pit increased during rainfall under certain circumstances.

As part of an investigation to locate the portion of the rain water inflow, water was sprinkled on the ground surface around the pit for the period April – May and it was determined that the water level increased when water was sprinkled on the southeast side of the pit.

An onsite inspection, which was implemented despite the high doses involved, detected a manhole from which rainwater was considered to inflow.

Measures to prevent rainwater inflow will be implemented for that portion.





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

An investigation implemented for obstacles inside the Unit 1 PCV, in which information of obstacle location is acquired prior to the internal investigation

During the period April 23-29, 2021, an investigation was implemented for obstacles inside the Primary Containment Vessel (PCV) and information on obstacle location such as instrument piping and conduit was acquired.

Based on this location information, the route to insert the equipment for the PCV internal investigation was confirmed.

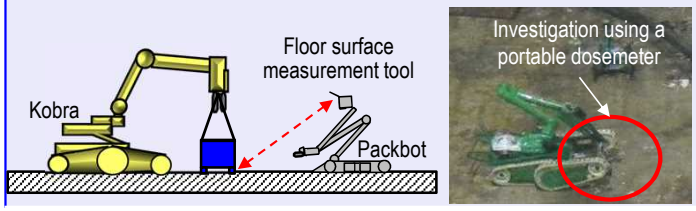
Preparation is underway to resume obstacle cutting work. Work continues with safety first.

Investigation on the Unit 2 operating floor implemented with the Secretariat of the Nuclear Regulation Authority

On April 14 and 15, an investigation was implemented on the floor surface and the ceiling surface of the Unit 2 operation floor.

It was evaluated that a higher air dose rate (max. approx. 117 mSv/h) on the shield plug than elsewhere was attributable to the effect of cesium accumulated in a space and the lower part of the shield plug.

To achieve a target dose of 1 mSv/h or less for the operating floor, decontamination and shielding will be implemented.



Investigation inside the Unit 2 reactor well (flash report)

On May 20, the inside of the reactor well under the Unit 2 shield plug, where a high dose was detected, was investigated using a camera and dosemeter. Samples were also taken from pipes connecting to the inside of the well or others on April 23.

The maximum dose equipment rate at the measured point was 530 mSv/h.

To utilize the result in future decommissioning work, investigations inside the reactor well will continue.

<Condition under the shield plug>

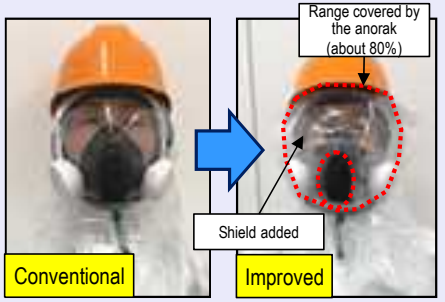
An anorak for a full-face mask introduced as part of countermeasures to prevent intake

During work in buildings with a high level of contamination or others, each worker wears a full-face mask and radiation protection equipment (anorak) covering the whole body.

Some events involved contamination attached on the surface of the full-face mask spreading to the face. As a part of countermeasures, an anorak capable of covering about 80% of the head and full-face mask is introduced.

The anorak has other features to alleviate feelings of discomfort while being worn: to secure visibility, a shield is added on the face part; and the part covering the filter of the full-face mask can be squeezed with rubber and cut to prevent breezing.

Work to improve equipment and other factors will continue for better work environment.



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
May 26th, 2021 *Discharged on May 31st	Cs-134	ND (0.61)	ND (0.65)
	Cs-137	ND (0.65)	ND (0.58)
	Gross β	ND (1.8)	ND (0.31)
	H-3	820	840
May 24th, 2021 *Discharged on May 29th	Cs-134	ND (0.72)	ND (0.52)
	Cs-137	ND (0.58)	ND (0.80)
	Gross β	ND (1.8)	ND (0.28)
	H-3	910	940
May 23rd, 2021 *Discharged on May 28th	Cs-134	ND (0.60)	ND (0.64)
	Cs-137	ND (0.54)	ND (0.61)
	Gross β	ND (1.8)	ND (0.36)
	H-3	990	1,000
May 21st, 2021 *Discharged on May 26th	Cs-134	ND (0.67)	ND (0.70)
	Cs-137	ND (0.54)	ND (0.61)
	Gross β	ND (0.58)	ND (0.36)
	H-3	900	910
May 20th, 2021 *Discharged on May 25th	Cs-134	ND (0.75)	ND (0.42)
	Cs-137	ND (0.69)	ND (0.66)
	Gross β	ND (1.6)	ND (0.37)
	H-3	910	930
May 18th, 2021 *Discharged on May 23rd	Cs-134	ND (0.55)	ND (0.67)
	Cs-137	ND (0.54)	ND (0.54)
	Gross β	ND (1.7)	ND (0.30)
	H-3	900	900
May 17th, 2021 *Discharged on May 22nd	Cs-134	ND (0.72)	ND (0.58)
	Cs-137	ND (0.65)	ND (0.66)
	Gross β	ND (1.9)	ND (0.30)
	H-3	960	1,000
May 15th, 2021 *Discharged on May 20th	Cs-134	ND (0.56)	ND (0.55)
	Cs-137	ND (0.69)	ND (0.71)
	Gross β	ND (1.9)	ND (0.34)
	H-3	830	870

May 14th, 2021 *Discharged on May 19th	Cs-134	ND (0.73)	ND (0.52)
	Cs-137	ND (0.69)	ND (0.63)
	Gross β	ND (1.9)	ND (0.31)
	H-3	780	790
May 12th, 2021 *Discharged on May 18th	Cs-134	ND (0.72)	ND (0.58)
	Cs-137	ND (0.60)	ND (0.69)
	Gross β	ND (1.8)	ND (0.36)
	H-3	1,000	1,000
May 11th, 2021 *Discharged on May 16th	Cs-134	ND (0.66)	ND (0.58)
	Cs-137	ND (0.60)	ND (0.61)
	Gross β	ND (0.59)	ND (0.38)
	H-3	860	890
May 9th, 2021 *Discharged on May 14th	Cs-134	ND (0.46)	ND (0.52)
	Cs-137	ND (0.65)	ND (0.69)
	Gross β	ND (1.8)	ND (0.35)
	H-3	770	790
May 8th, 2021 *Discharged on May 13th	Cs-134	ND (0.58)	ND (0.60)
	Cs-137	ND (0.77)	ND (0.66)
	Gross β	ND (1.7)	ND (0.33)
	H-3	830	840
May 6th, 2021 *Discharged on May 11th	Cs-134	ND (0.55)	ND (0.62)
	Cs-137	ND (0.60)	ND (0.42)
	Gross β	ND (1.8)	ND (0.32)
	H-3	800	840
May 5th, 2021 *Discharged on May 10th	Cs-134	ND (0.45)	ND (0.65)
	Cs-137	ND (0.65)	ND (0.54)
	Gross β	ND (1.8)	ND (0.33)
	H-3	830	880
May 3rd, 2021 *Discharged on May 8th	Cs-134	ND (0.59)	ND (0.54)
	Cs-137	ND (0.73)	ND (0.69)
	Gross β	ND (1.6)	ND (0.34)
	H-3	880	900
May 2nd, 2021 *Discharged on May 7th	Cs-134	ND (0.56)	ND (0.80)
	Cs-137	ND (0.73)	ND (0.67)
	Gross β	ND (0.58)	ND (0.33)
	H-3	1,100	1,100
April 30th, 2021 *Discharged on May 5th	Cs-134	ND (0.61)	ND (0.58)
	Cs-137	ND (0.77)	ND (0.50)
	Gross β	ND (1.8)	ND (0.33)
	H-3	1,000	1,000

April 29th, 2021 *Discharged on May 4th	Cs-134	ND (0.61)	ND (0.70)
	Cs-137	ND (0.69)	ND (0.58)
	Gross β	ND (1.8)	ND (0.37)
	H-3	1,000	1,100
April 26th, 2021 *Discharged on May 1st	Cs-134	ND (0.60)	ND (0.50)
	Cs-137	ND (0.69)	ND (0.71)
	Gross β	ND (1.9)	0.37
	H-3	1,000	1,100

- * 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
April 1st,2021	Cs-134	ND (0.0030)	ND (0.0048)	ND (0.0069)
	Cs-137	0.0080	0.010	0.012
	Gross α	ND (0.60)	ND (3.1)	ND (2.0)
	Gross β	ND (0.38)	ND (0.66)	ND (0.59)
	H-3	790	780	790
	Sr-90	0.0020	ND (0.0022)	ND (0.0054)

* 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)
March 8th, 2021 *Sampled before discharge of purified groundwater.	Cs-134	ND (0.79)
	Cs-137	ND (0.90)
	Gross β	14
	H-3	ND (0.79)

(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
May 19th, 2021 *Discharged on May 27th	Cs-134	ND (0.82)	ND (0.48)
	Cs-137	ND (0.54)	ND (0.38)
	Gross β	ND (0.71)	ND (0.55)
	H-3	70	70
May 12th, 2021 *Discharged on May 20th	Cs-134	ND (0.60)	ND (0.45)
	Cs-137	ND (0.56)	ND (0.56)
	Gross β	ND (0.78)	ND (0.59)
	H-3	65	73
May 5th, 2021 *Discharged on May 13th	Cs-134	ND (0.80)	ND (0.58)
	Cs-137	ND (0.74)	ND (0.57)
	Gross β	ND (0.71)	ND (0.33)
	H-3	78	81
April 28th, 2021 *Discharged on May 6th	Cs-134	ND (0.77)	ND (0.51)
	Cs-137	ND (0.69)	ND (0.63)
	Gross β	ND (0.51)	ND (0.33)
	H-3	88	88

∗ * 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
April 7th, 2021	Cs-134	ND (0.0030)	ND (0.0050)	ND (0.0073)
	Cs-137	ND (0.0020)	0.0045	ND (0.0049)
	Gross α	ND (0.42)	ND (3.1)	ND (2.0)
	Gross β	ND (0.39)	ND (0.65)	ND (0.54)
	H-3	92	90	90
	Sr-90	0.0012	ND (0.0016)	ND (0.0053)

* 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)
March 8th, 2021	Cs-134	ND (0.73)
	Cs-137	ND (0.65)
	Gross β	12
	H-3	2.8

(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.