Radioactive wastes in Fukushima Daiichi NPS

August 20, 2024

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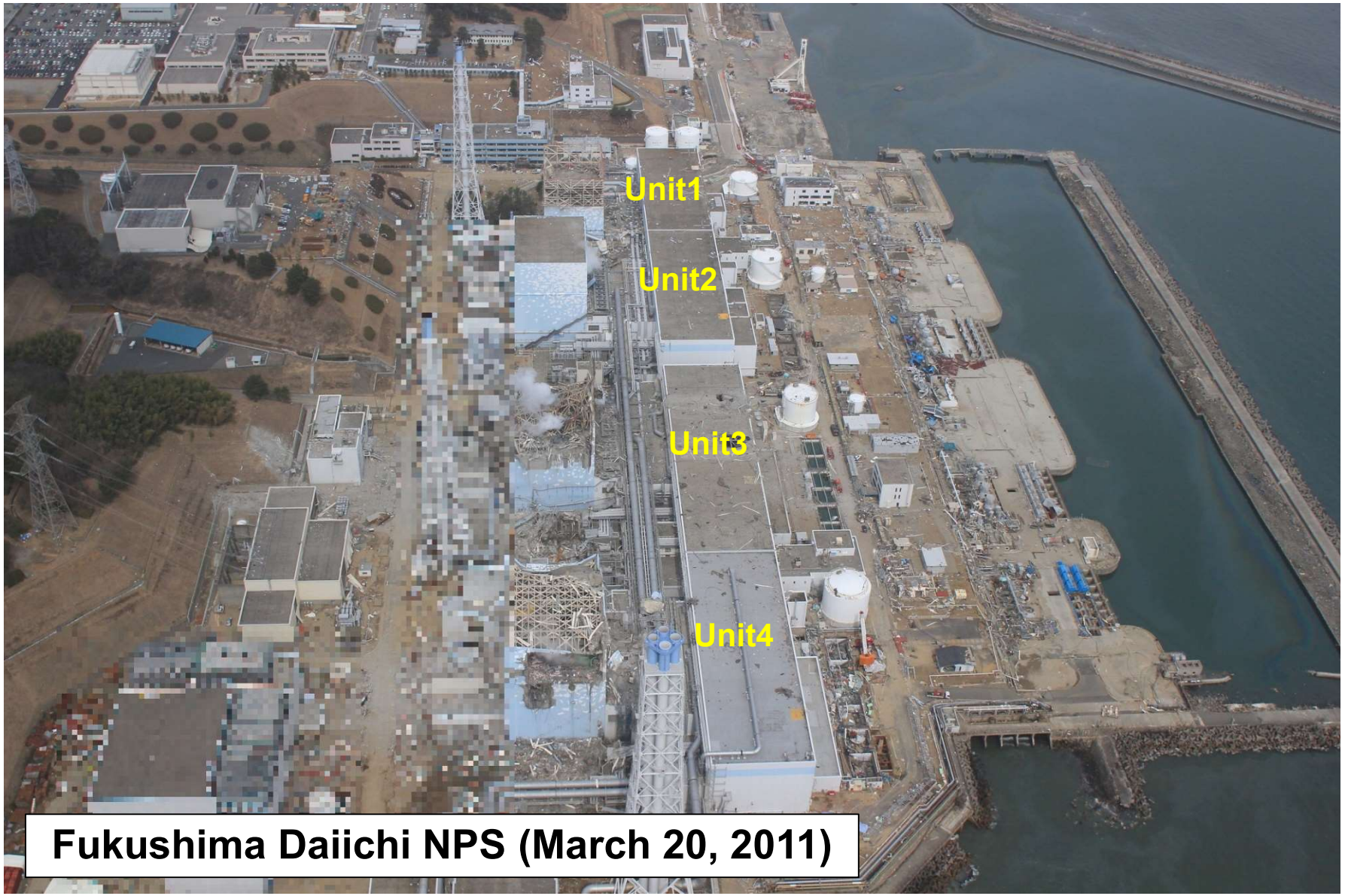
TEPCO

SPANS

Fukushima Daiichi Accident

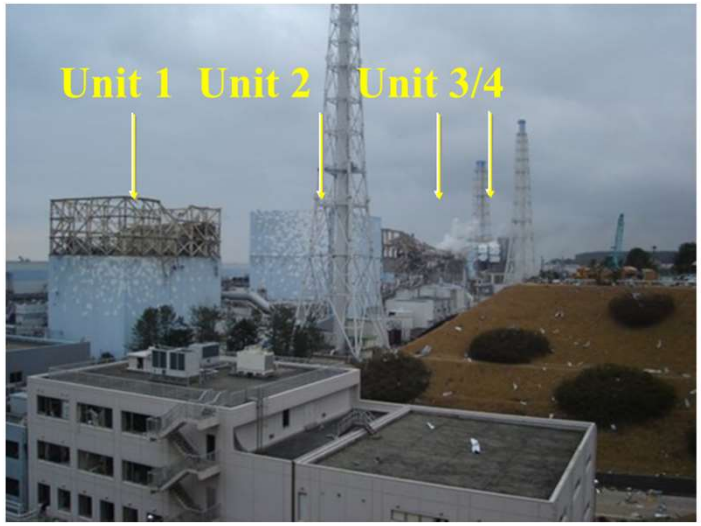


Fukushima Daiichi NPS (March 20, 2011)

Accident at Fukushima Daiichi in March 11

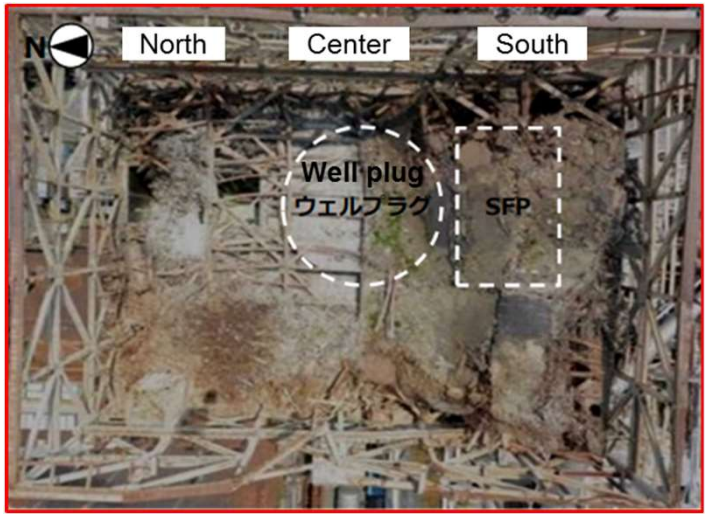
Unit	1	2	3	4	5	6
Operating on Mar. 11	●	●	●	–	–	–
Meltdown	●	●	●	–	–	–
Explosion	●	–	●	●	–	–

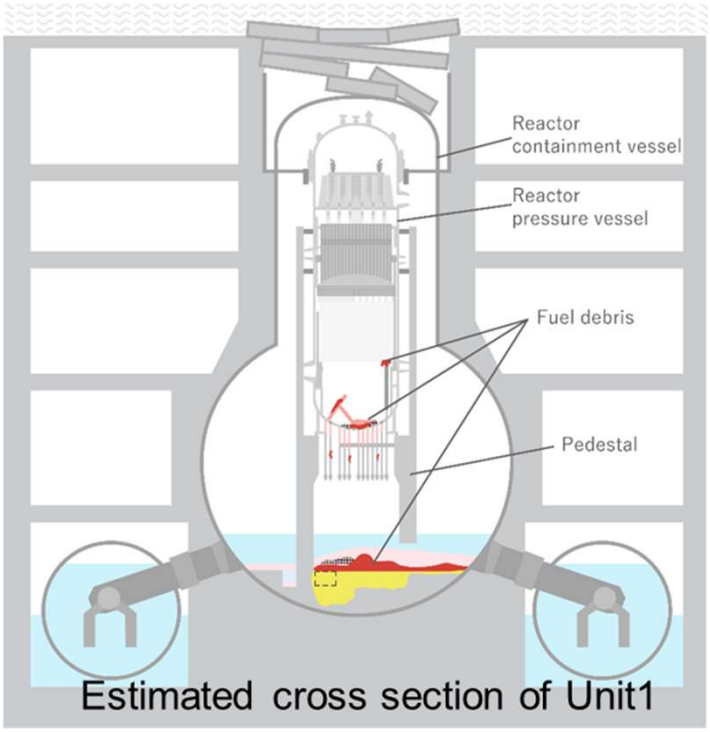
Currently, Units 1 to 3 are in cold shutdown status



Fukushima Daiichi Accident

- **Meltdown**
  - Fuel in RPVs and in-core structure materials melted and dropped to the bottom of PCVs
  - Since both RPVs and PCVs are damaged, shielding by water is impossible → High radiation dose
- **Hydrogen explosion**
  - Refueling floor is covered by collapsed roof
  - Fallout as a result of radioactive materials released to air
- **Contaminated water generation**
  - Groundwater and rainwater flow into the buildings and contact the fuel debris.





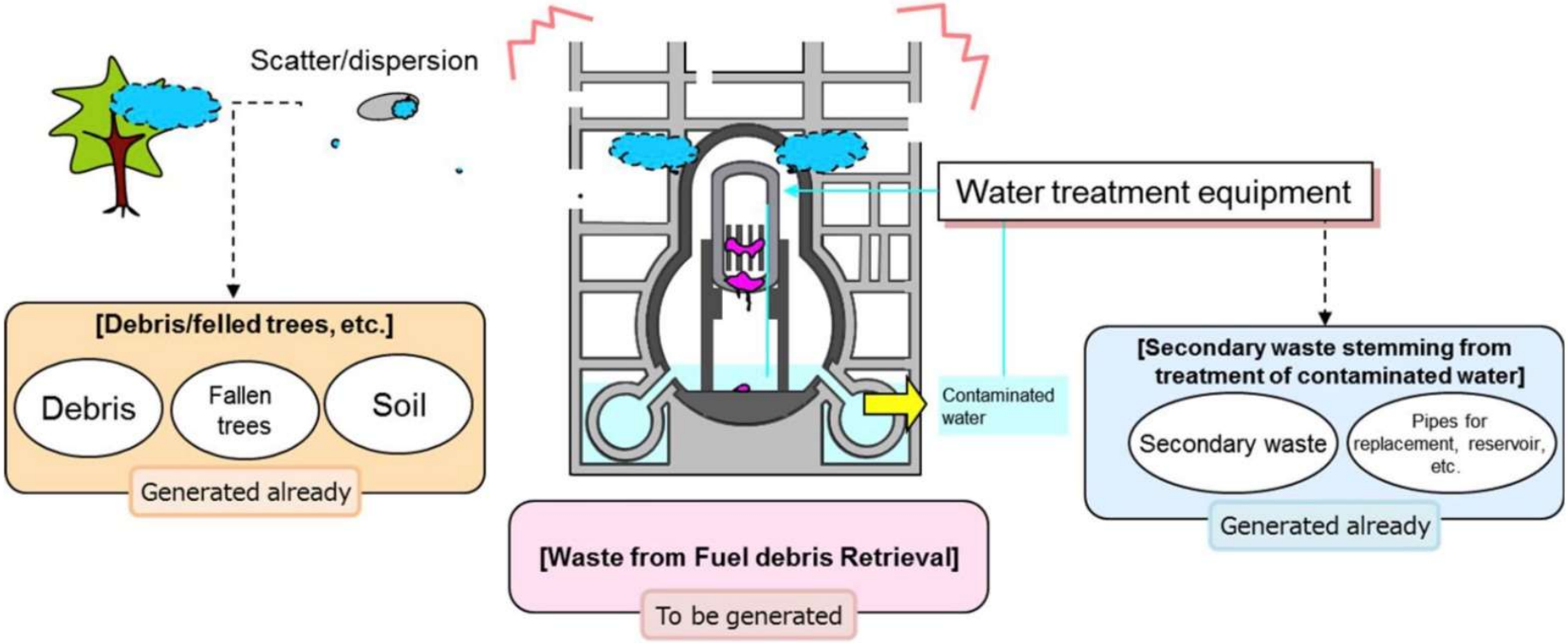
Estimated cross section of Unit1

The damage at Fukushima Daiichi Nuclear Power Station Units 1-4, photographed March 19, 2011

Waste generation in Fukushima Daiichi

Waste generated at Fukushima Daiichi

Due to fuel failure, the waste contains fission products or α nuclides such as Cs-137 and Sr-90.
cf. Normal power plants: Co-60

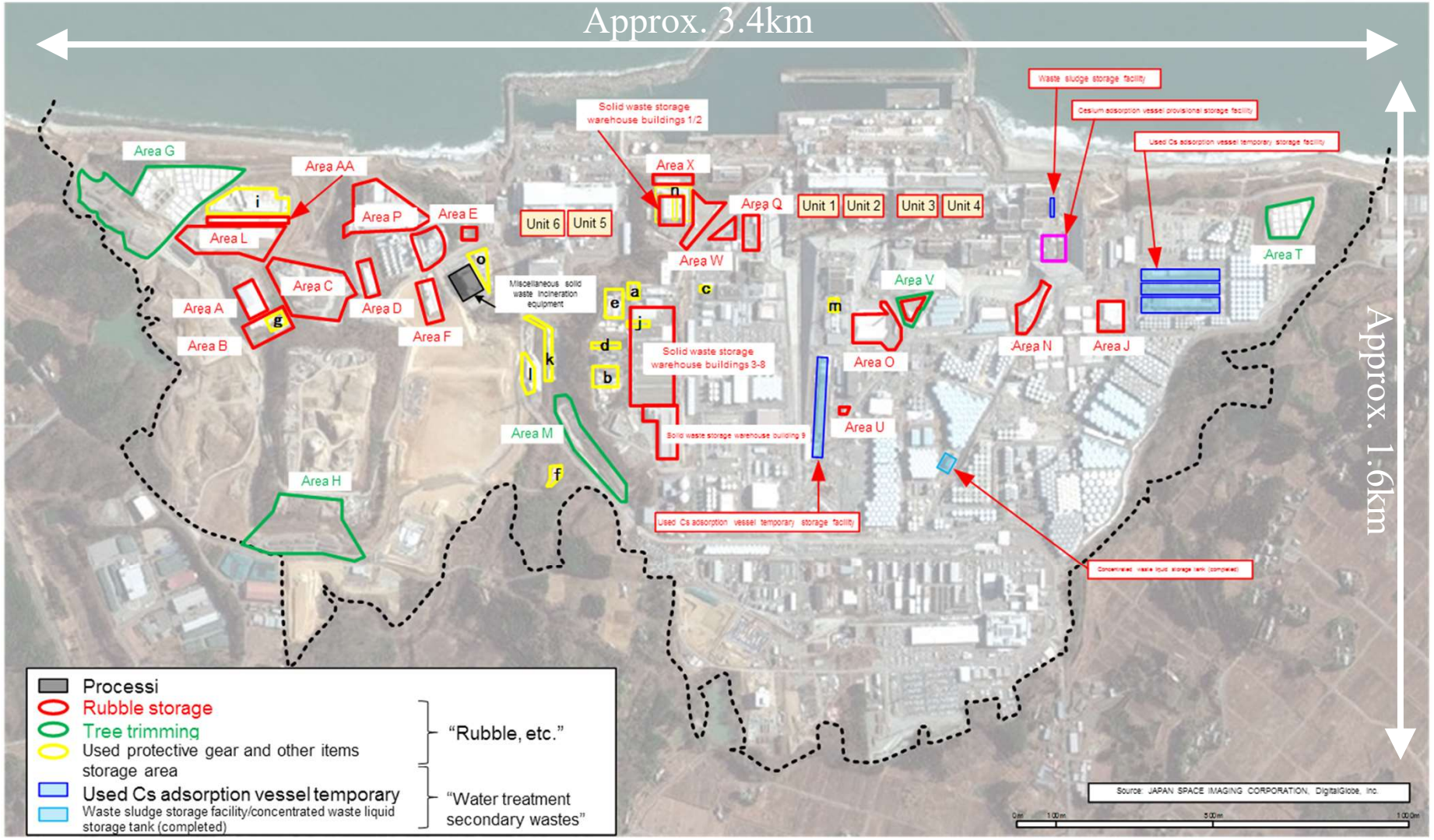


Waste disposal of Fukushima Daiichi

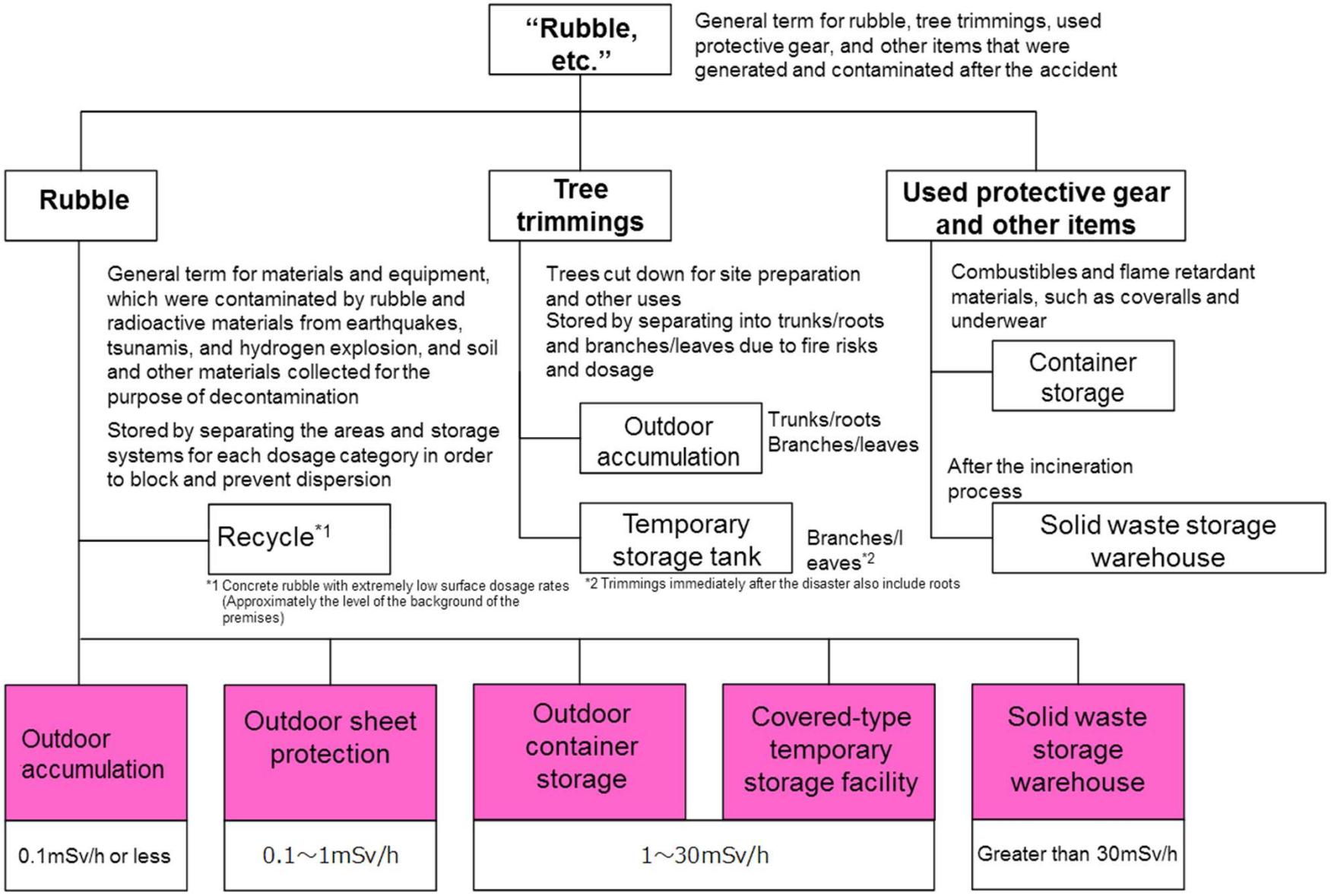
Waste from Fukushima Daiichi cannot be taken out of the controlled area at Fukushima Daiichi.
The waste have to be stabilized and managed on-site.

Storage status of “rubble, etc.” and “water treatment secondary waste”

- There are a number of outdoor temporary storage areas on the premises.
- Current waste volume at Fukushima Daiichi: Approx. 480,000m^3
  (cf. Normal BWR rubble: Approx. 10,000m^3/unit).



Definition of “Rubble, etc.”



Definition of “water treatment secondary waste”

“Water treatment secondary waste”

Adsorption vessel *1, 2	**Waste sludge (Decontamination instrument sludge)** *3	**Concentrated effluent slurry** *4
Store in Spent Adsorption Vessel Temporary Storage Facility	Stored in waste sludge storage facility (Basement of Process Main Building)	Store in Effluent storage tank

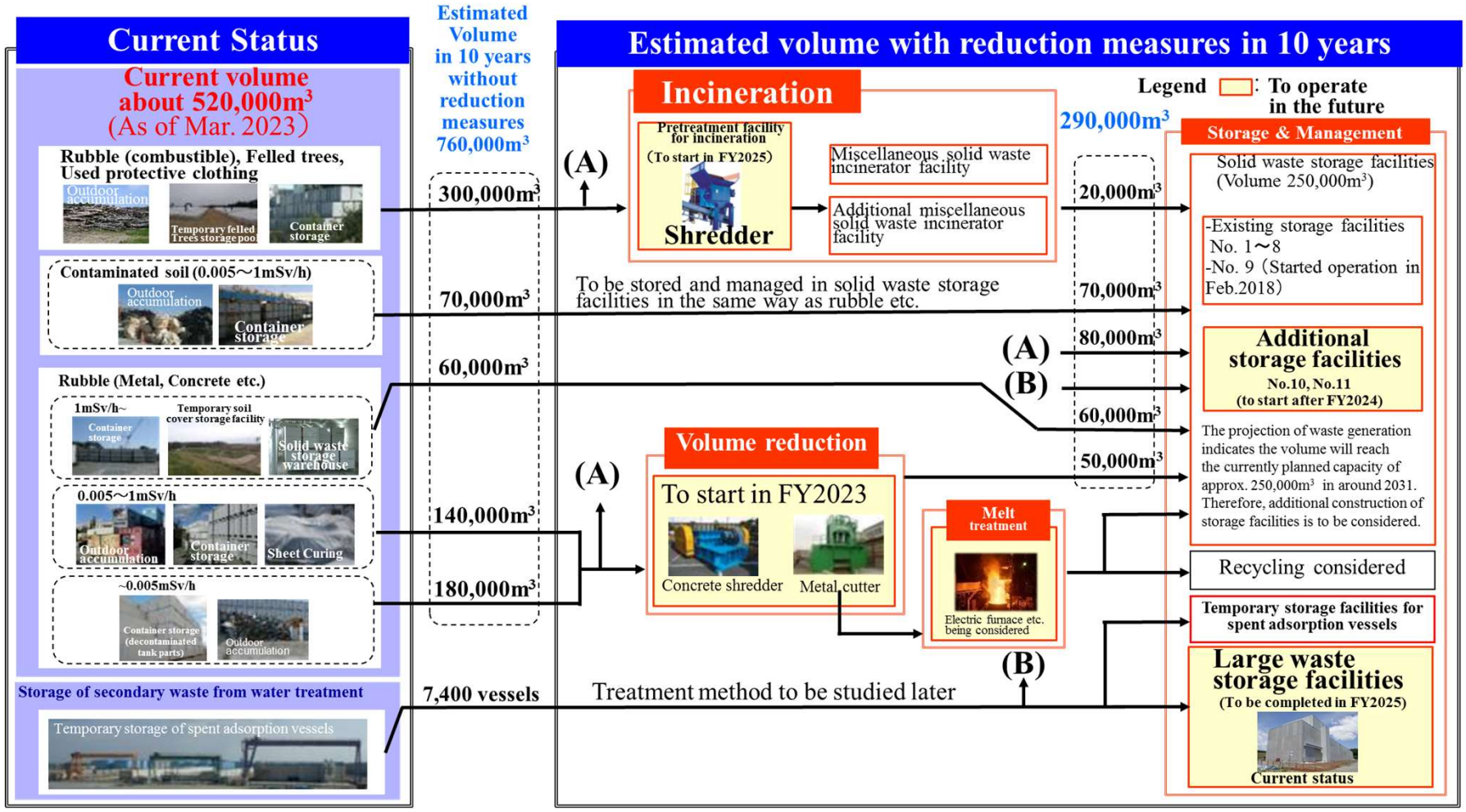
Stored by the type of adsorption vessel

In rack	**In box culvert**	**In HIC compatible (watertight) box culvert**
Vessels not additional shielding required (ex. Adsorption vessels from SARRY)	Vessels require additional shielding (ex. Adsorption vessels from KURION)	Mainly composed of water (ex. HIC from ALPS)

*1 Waste generated in the treatment of contaminated water such as stagnant water in buildings. In addition to adsorbents, this includes slurry and filters from the mobile treatment equipment.
*2 Filters other than those from the mobile treatment device will be contained in containers and then stored in the solid waste storage facility or temporary rubble storage area.
*3 Coagulated sediment generated in the operation of the decontamination instrument. There are no plans to operate this equipment for treatment, so no new waste is expected to be generated.
*4 Solids in the waste liquid that is reduced volume by the evaporative concentrator with concentrated water from RO facility. There are no plans to operate evaporative concentrator, so no new waste is expected to be generated.

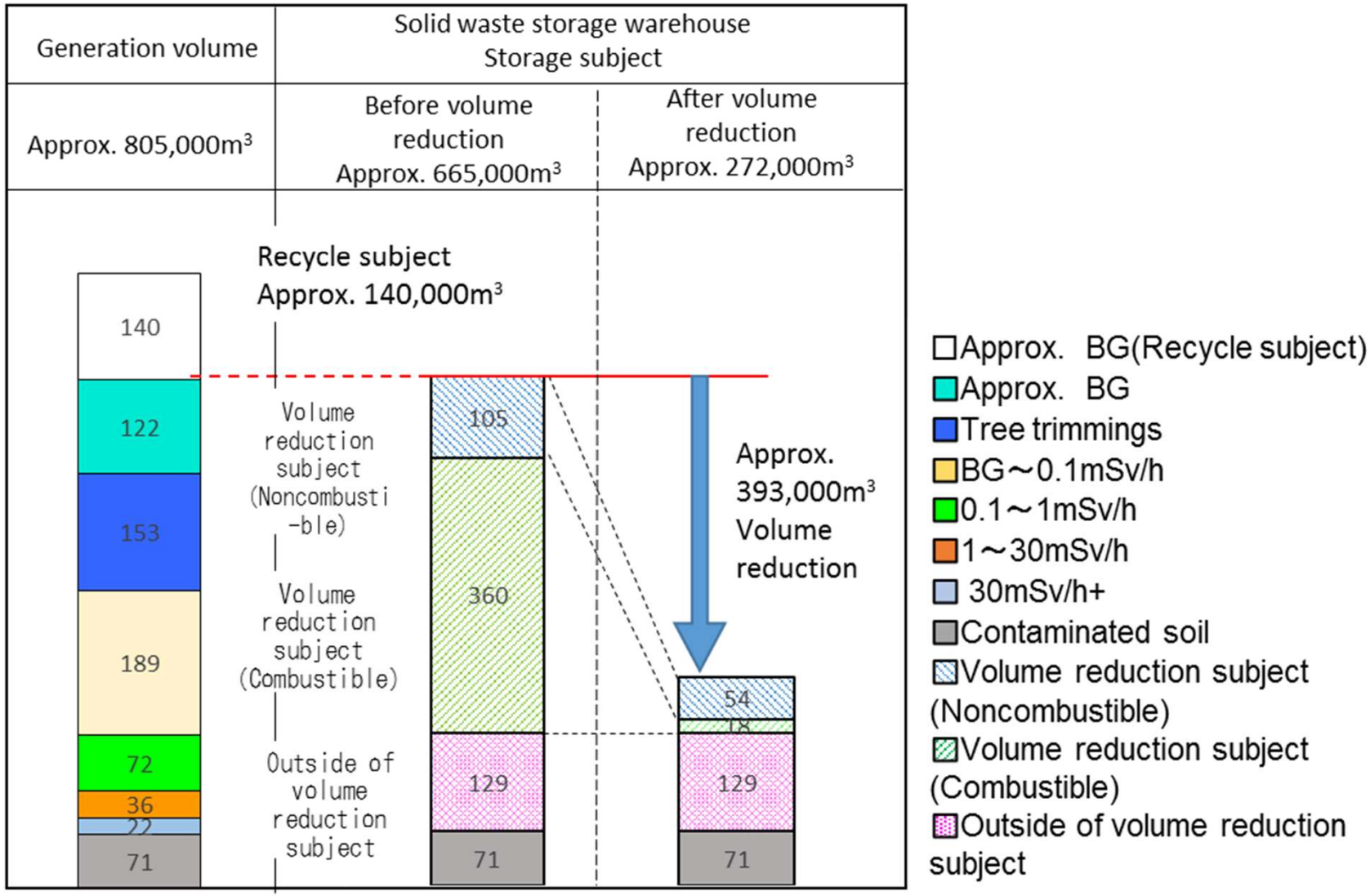
Solid Waste Storage Manage plan (revised in November 2023)

- The entire area of the Fukushima Daiichi Nuclear Power Station(1F) is a controlled area, and waste generated from construction and other activities cannot be taken outside of 1F due to the possibility of contamination, and is temporarily stored within 1F.
- After volume reduction, the solid waste will be stored appropriately based on the “Solid Waste Storage Management Plan” updated annually.



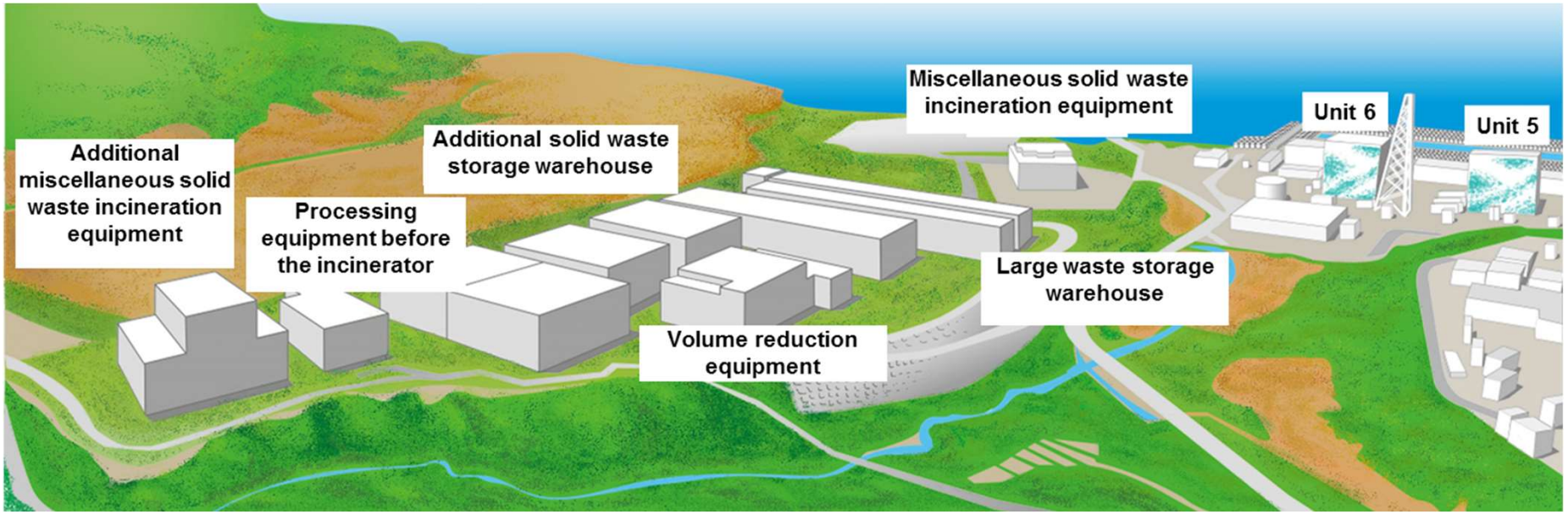
Generation volume forecast for “rubble waste, etc.”

As of March 2034



Blueprint for solid waste management-related facilities (overview)

- We have been building facilities to store solid waste indoors after volume reduction and incineration.



Additional miscellaneous solid waste incineration facility

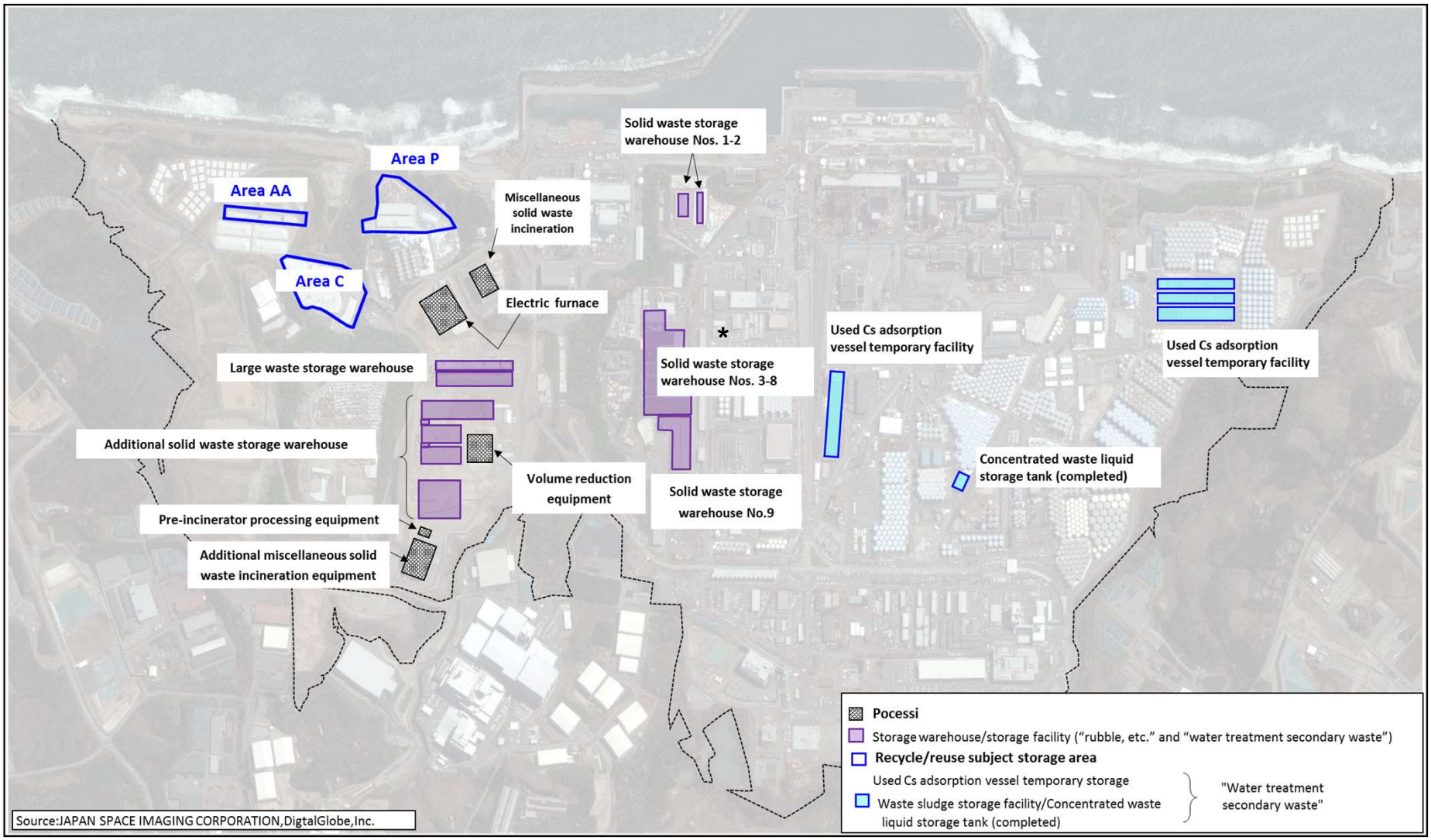
Volume reduction facility

Large waste storage warehouse

Future illustration of the storage of “rubble, etc.” and “water treatment secondary waste”

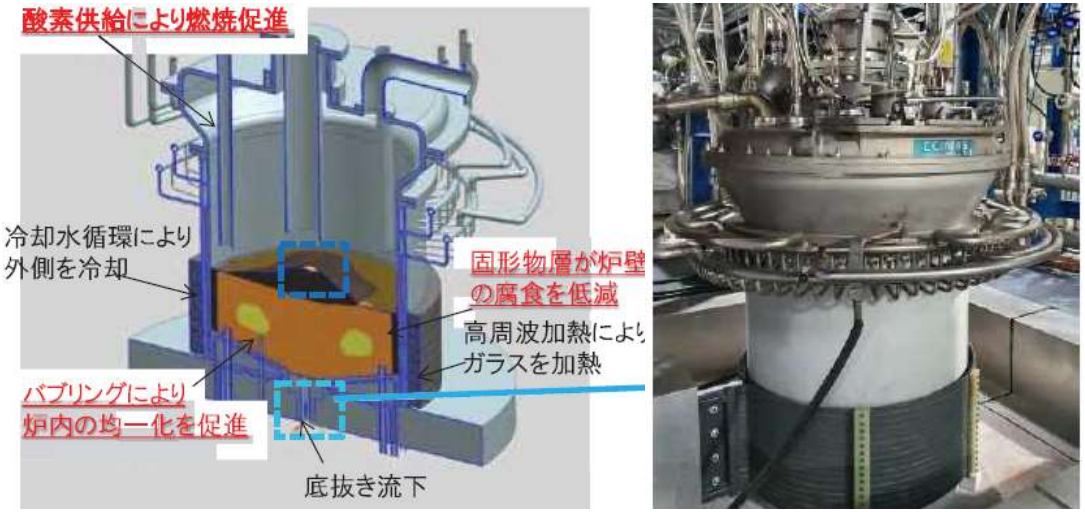
- We will eliminate the outdoor temporary storage of “rubble, etc." in FY2028*

*Excluding recycling/re-use targets

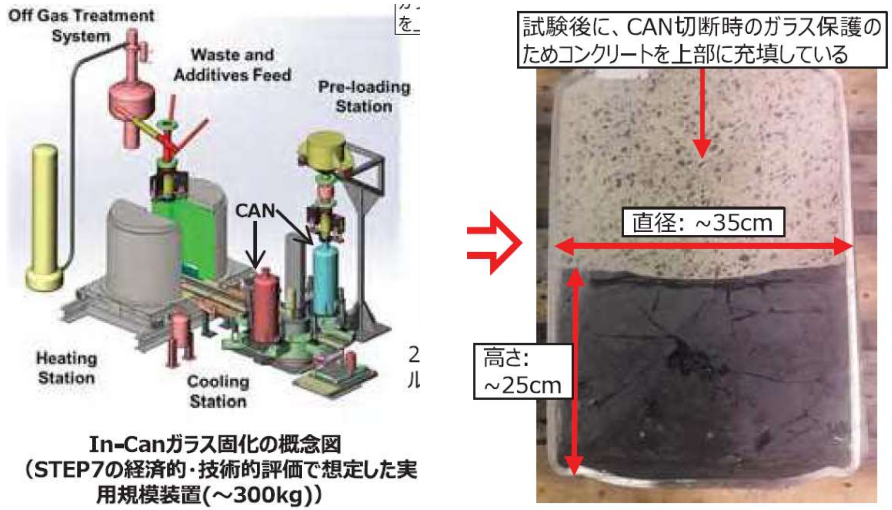


R&D for future processing of waste

- R&D and verification tests have been conducted in order for the radioactive solid waste to be stabilized for the long term and stored & managed in a safe and appropriate manner.

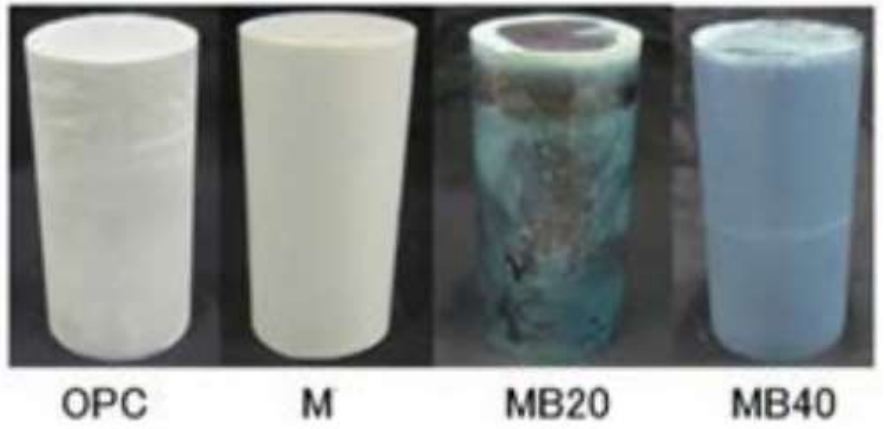


IHI: CCIM (Cold Crucible Induction Melter)



ANADEC: In-Can

KURION Japan: GeoMelt® ICVTM



Cemented, AAM (Alkali Activated Materials)

TEPCO

Questions?

Please do not hesitate to contact me if you have any questions;

E-mail: paku.yunso@tepco.co.jp

Thank you!

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