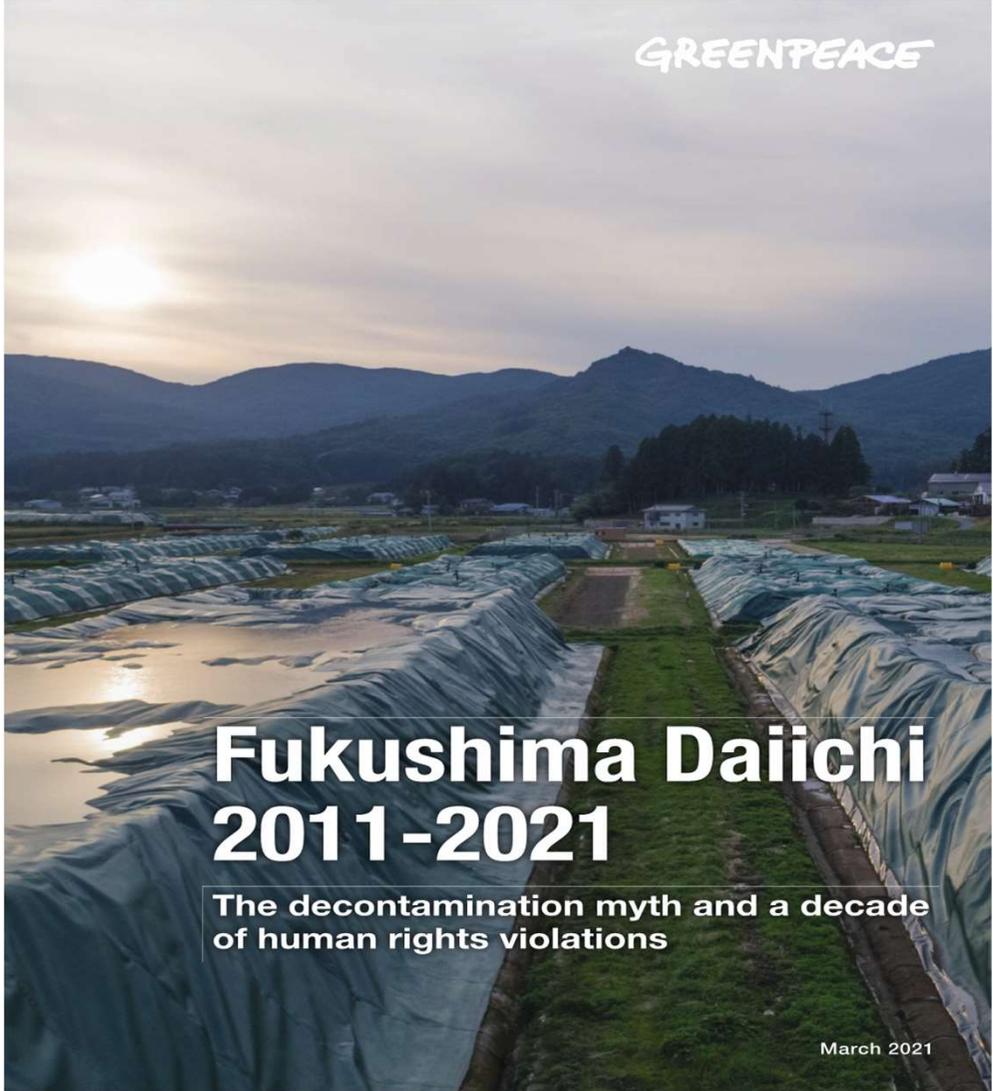




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# Fukushima Daiichi 2011-2021

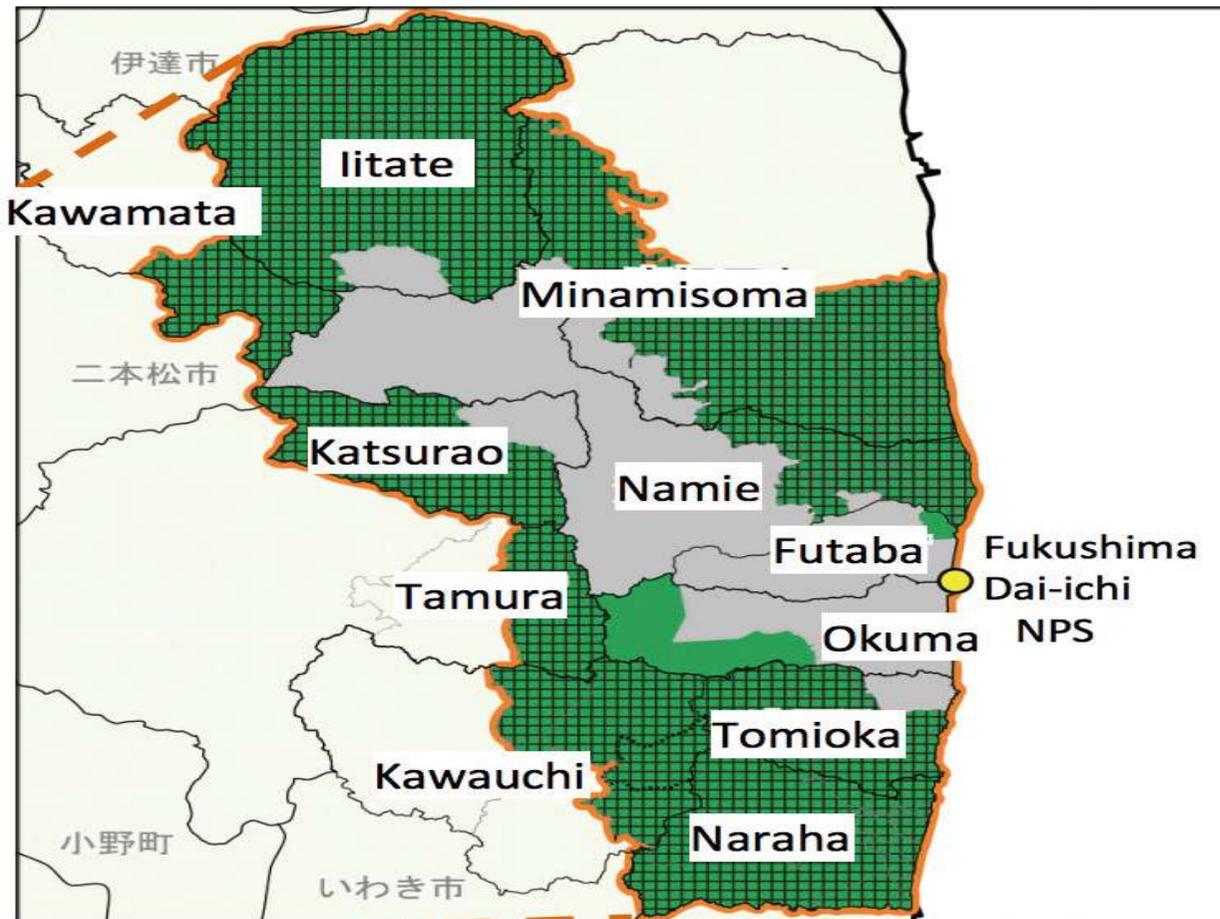
The decontamination myth and a decade  
of human rights violations

March 2021

## A decade of radiation surveys in Fukushima



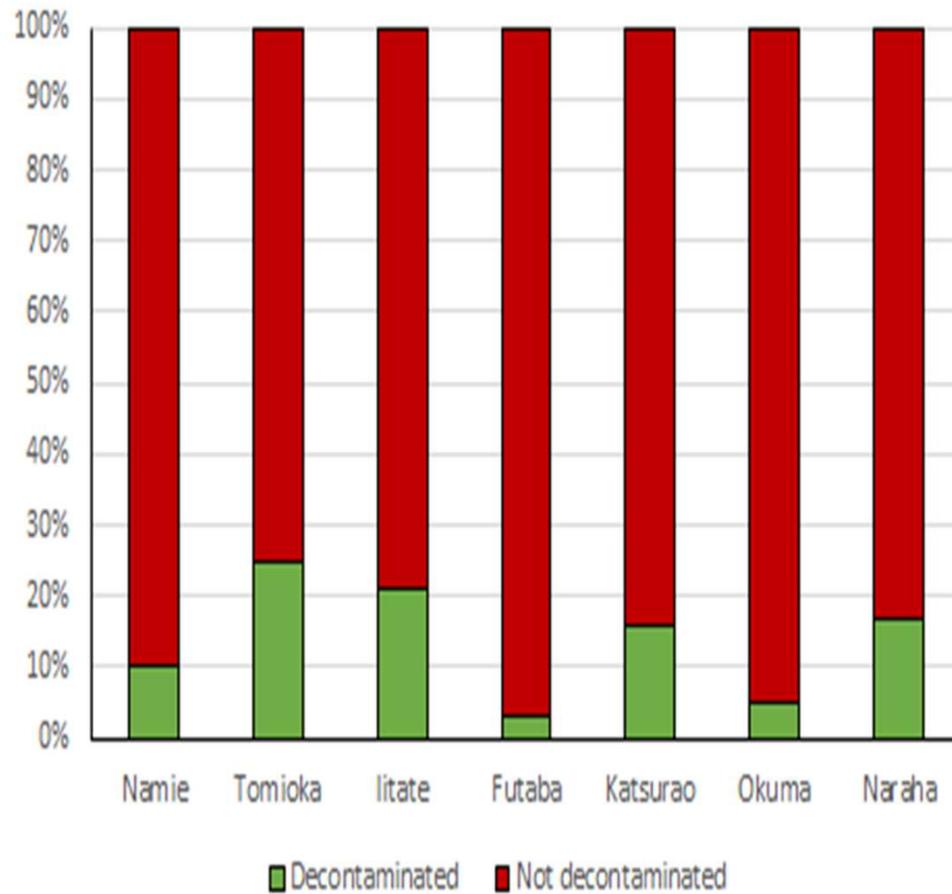
# Special Decontamination Area



# The decontamination myth



# The Decontamination Myth



## The Decontamination Myth

Districts	Total area - (hectares)	Decontaminated – as of 30/09/2017 (hectares)	Not Decontaminated (hectares)	Percentage Decontaminated	Percentage Not Decontaminated	Evacuation Order Lifted
Namie	22,314	2,140	20,174	10	90	March 31 2017
Tomioka	6,839	1,710	5,129	25	75	April 1 2017
litate	23,013	4,830	18,183	21	79	March 31 2017
Futaba	5,142	133	5,009	3	97	Partial lifting 3 March 2020
Katsurao	8,437	1,355	7,082	16	84	June 12 2016
Okuma	7,871	401	7,470	5	95	Partial lifting 5 March 2020
Naraha	10,364	1,740	8,624	17	83	September 5 2015
<b>Total</b>	<b>83,980</b>	<b>12,309</b>	<b>71,671</b>	<b>15</b>	<b>85</b>	

# Radiation survey in Namie

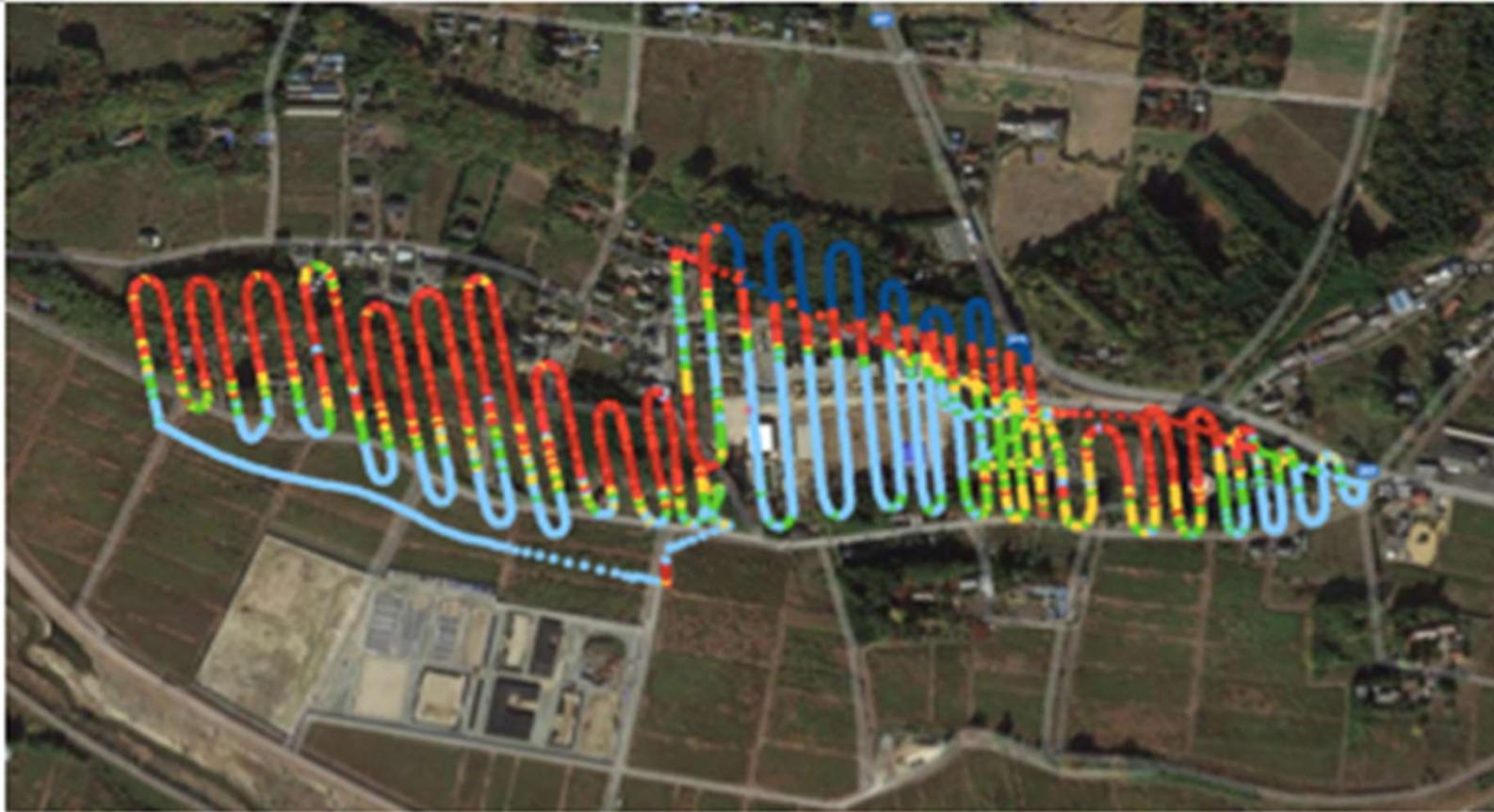


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## Namie kindergarten and school

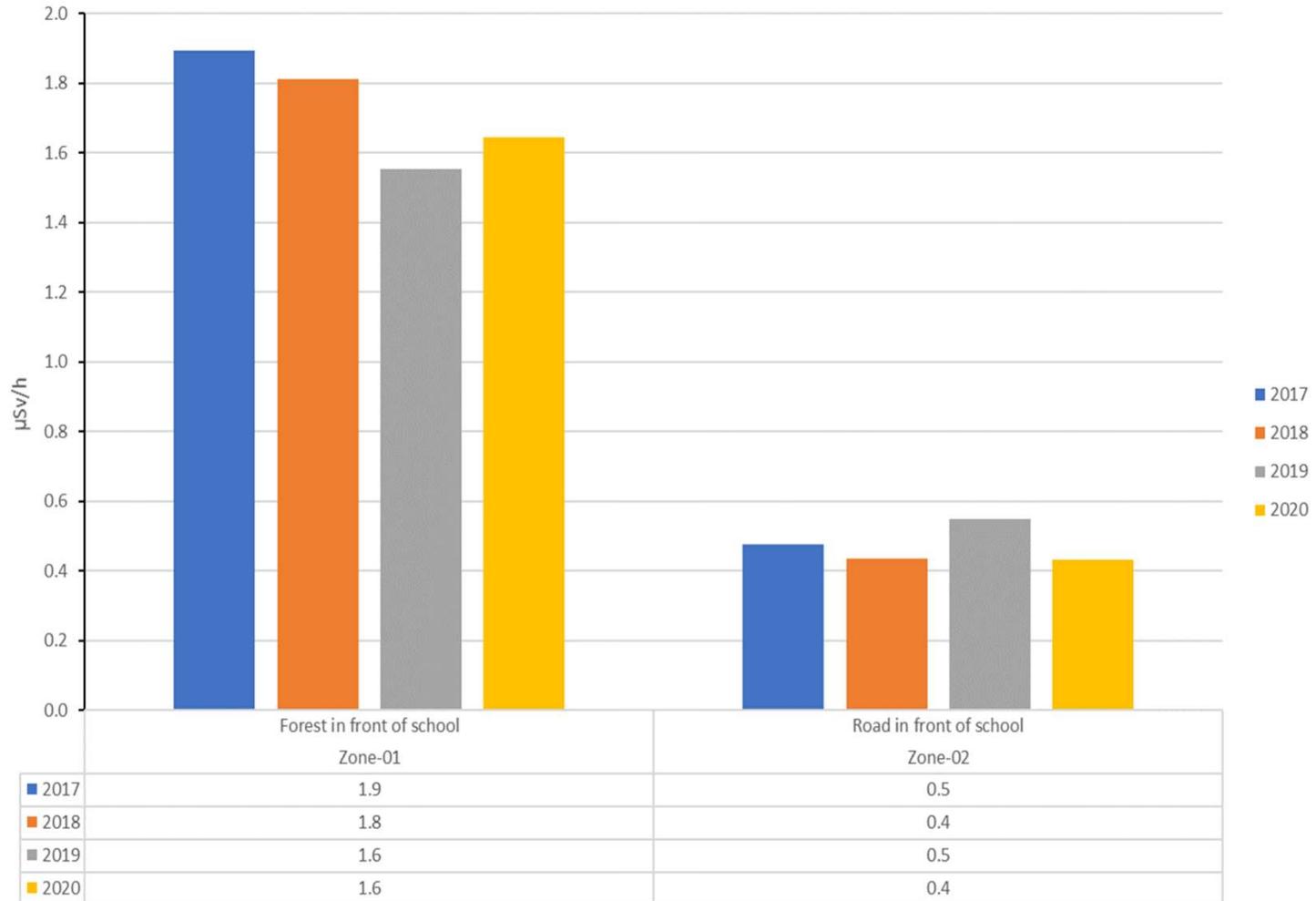


## Namie kindergarten and school



UAV Aerial survey at 100 meters of child care and school, Namie Town, October 2018. >

# Namie kindergarten and school



## Survey of Namie kindergarten and school - 2017-2020

Zone name		Max ( $\mu\text{Sv/h}$ )				Average ( $\mu\text{Sv/h}$ )				Average % of previous year			
		2020	2019	2018	2017	2020	2019	2018	2017	2020	2019	2018	2017
Zone-01	Forest in front of school	2.8	2.3	2.9	3.1	1.6	1.6	1.8	1.9	106%	86%	96%	n/a
Zone-02	Road in front of school	1.0	1.5	0.8	1.1	0.4	0.5	0.4	0.5	79%	126%	91%	n/a
<b>ALL</b>	<b>Summary*</b>	<b>2.8</b>	<b>2.3</b>	<b>2.9</b>	<b>3.1</b>	<b>1.0</b>	<b>1.1</b>	<b>1.1</b>	<b>1.2</b>	<b>92%</b>	<b>106%</b>	<b>93%</b>	<b>n/a</b>

Zone name		Number of points				Above 0.23 $\mu\text{Sv/h}$				Above 1 $\mu\text{Sv/h}$			
		2020	2019	2018	2017	2020	2019	2018	2017	2020	2019	2018	2017
Zone-01	Forest in front of school	822	2280	1584	822	100%	100%	100%	100%	88%	97%	99%	90%
Zone-02	Road in front of school	858	1468	698	674	93%	98%	98%	100%	0%	5%	0%	1%
<b>ALL</b>	<b>Summary*</b>	<b>1680</b>	<b>3748</b>	<b>2282</b>	<b>1496</b>	<b>97%</b>	<b>99%</b>	<b>99%</b>	<b>100%</b>	<b>44%</b>	<b>51%</b>	<b>50%</b>	<b>45%</b>

# Radiation survey results and observations



© Christian Åslund / Greenpeace

# **Radiation survey results and observations**

**Majority of Special Decontamination Area – 85% has had no decontamination work**

**Even where decontamination has been conducted, radiation levels remain above those seen pre-2011, and in many cases they are above the government's long-term target of 0.23  $\mu$ Sv/hour**

**Radiation in the environment in Fukushima Prefecture remains significant and complex  
Forests remain long term sources of contamination, including downstream – not possible to decontaminate  
Strong evidence of the effects of resuspension of Cs-137 due to flooding and typhoon effects**

**One decade after March 2011, we are in the early stages of the impact of this disaster  
30 year half life of Cs-137 - ten half lives before effectively gone - 300 years**

**In Namie and Iitate, where GP focused its research, radiation is at a level unsafe for human habitation even after decontamination  
Need for further investigations into the complex radioactive environment**

**This is not the official government narrative**

# Decommissioning of the Fukushima Daiichi Nuclear Power Station

From Plan-A to Plan-B  
Now, from Plan-B to Plan-C

Satoshi Sato

Former nuclear engineer, General Electric

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## Fukushima Daiichi Decommissioning Time for a new long term strategic plan

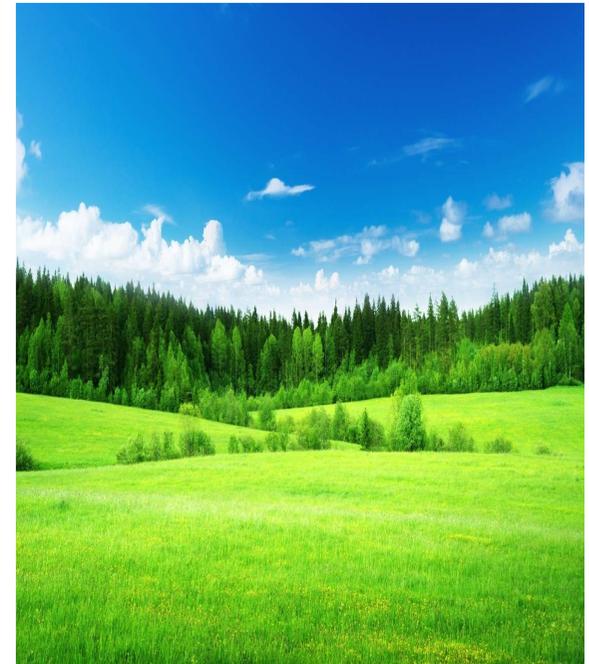
Greenpeace Briefing

Shaun Burnie · Greenpeace East Asia



March 2021

Official decommissioning plan – 30-40 years ?



**Six Boiling Water Reactors**

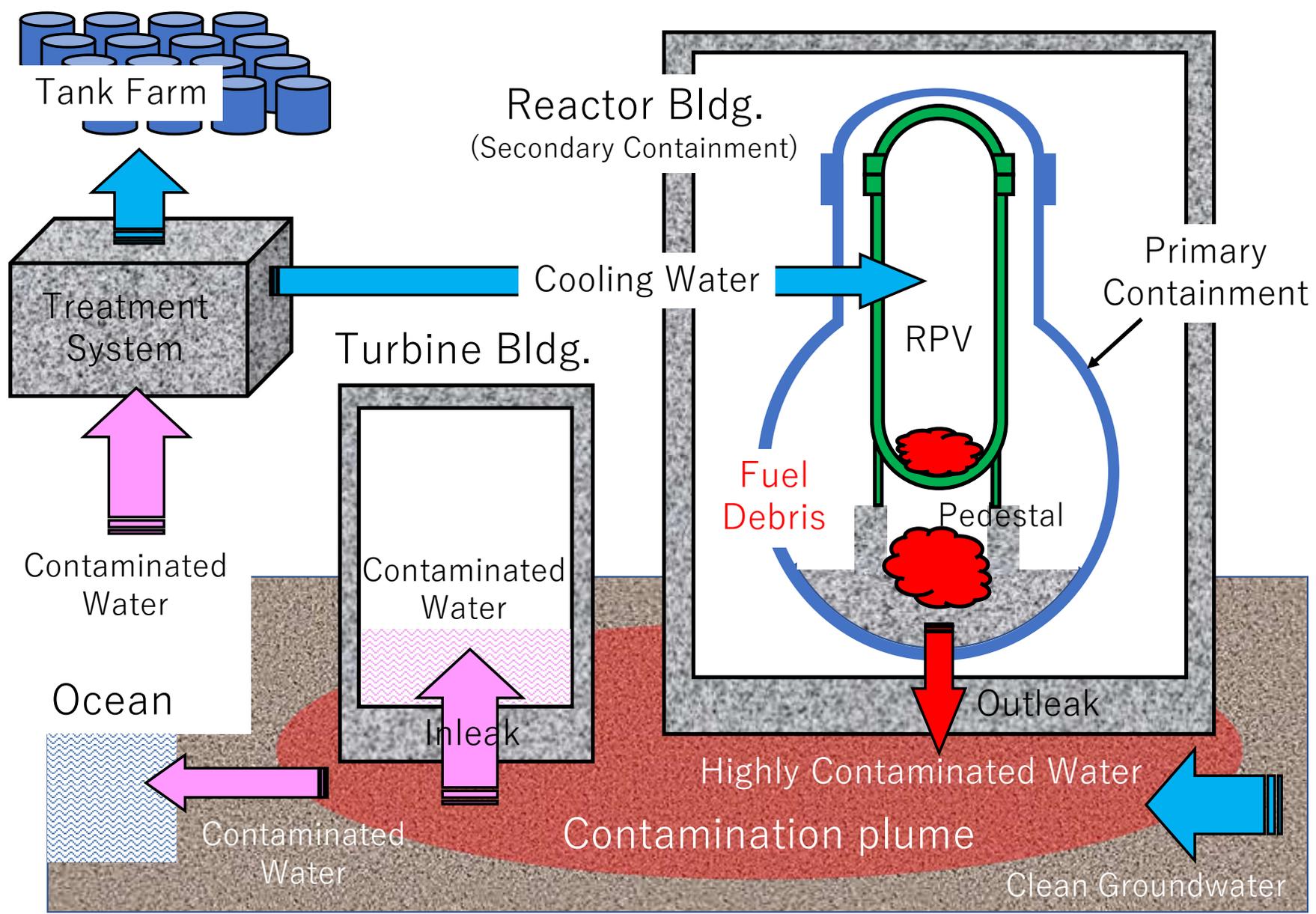
**1.23 million cubic meters of contaminated water**

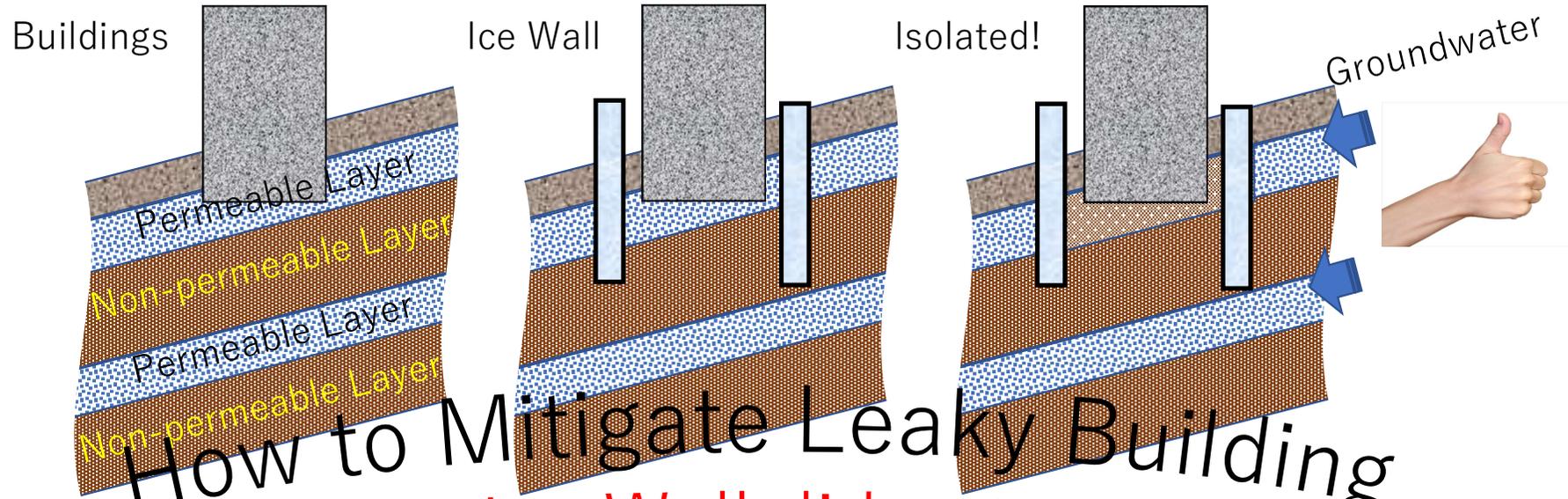
**Nuclear fuel debris 609-1100 tons**

**Thousands of tons of spent fuel**

**Many other buildings and structures**

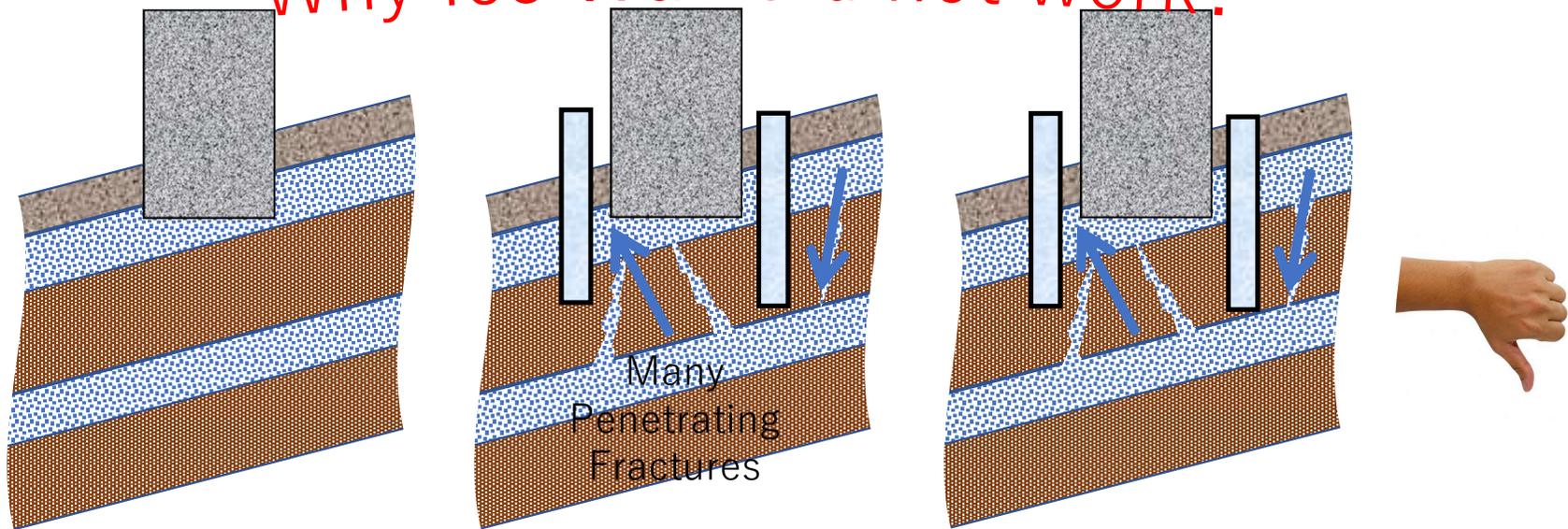




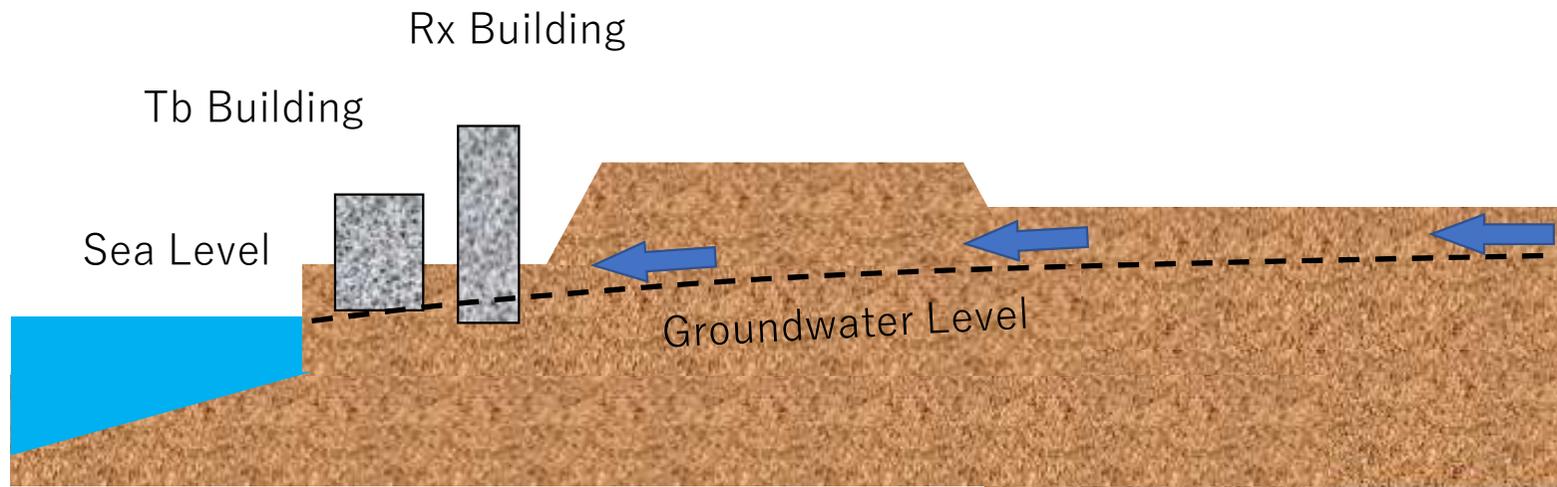


# How to Mitigate Leaky Building

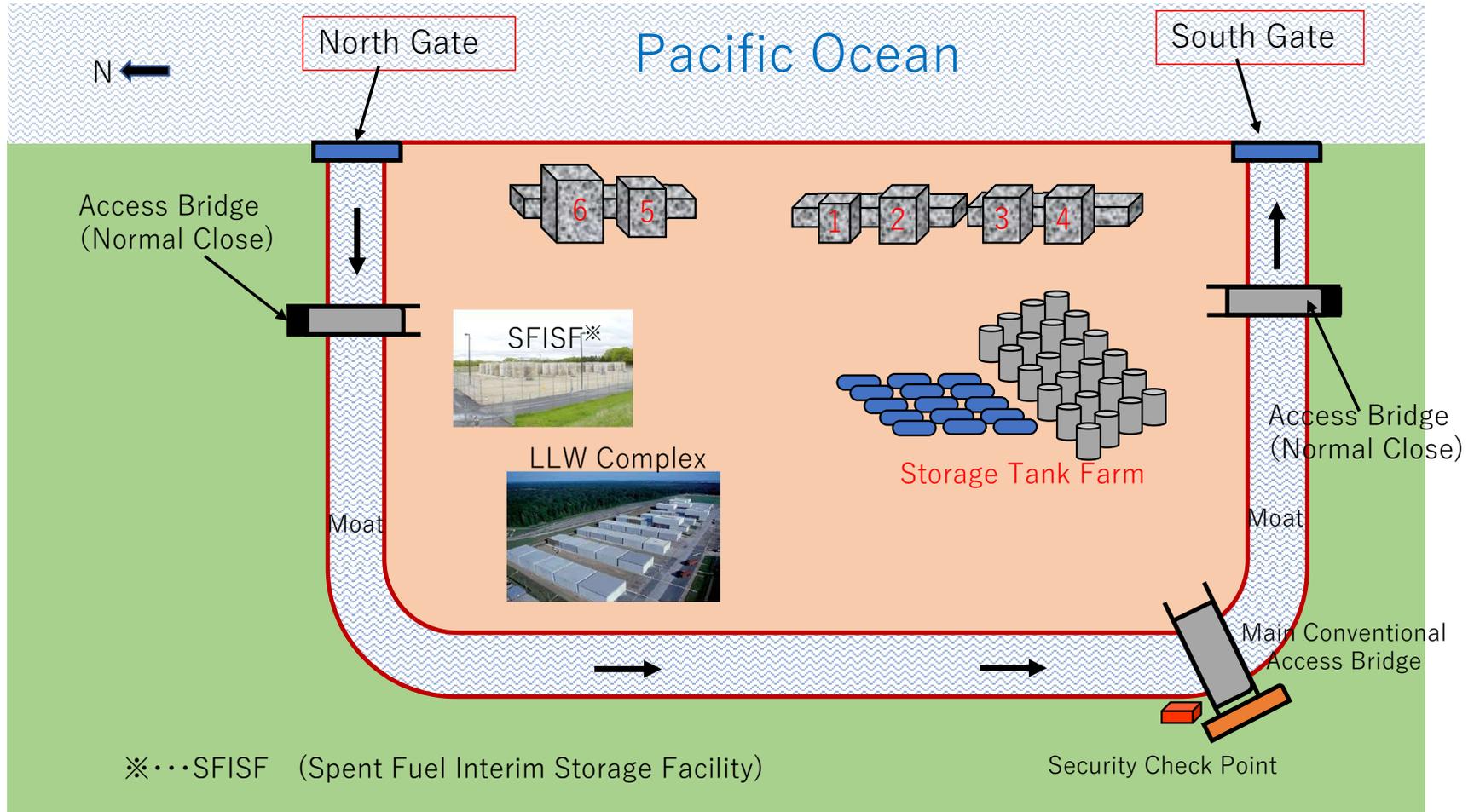
## Why Ice Wall did not work?



# Moat and “Dry Island” Concept



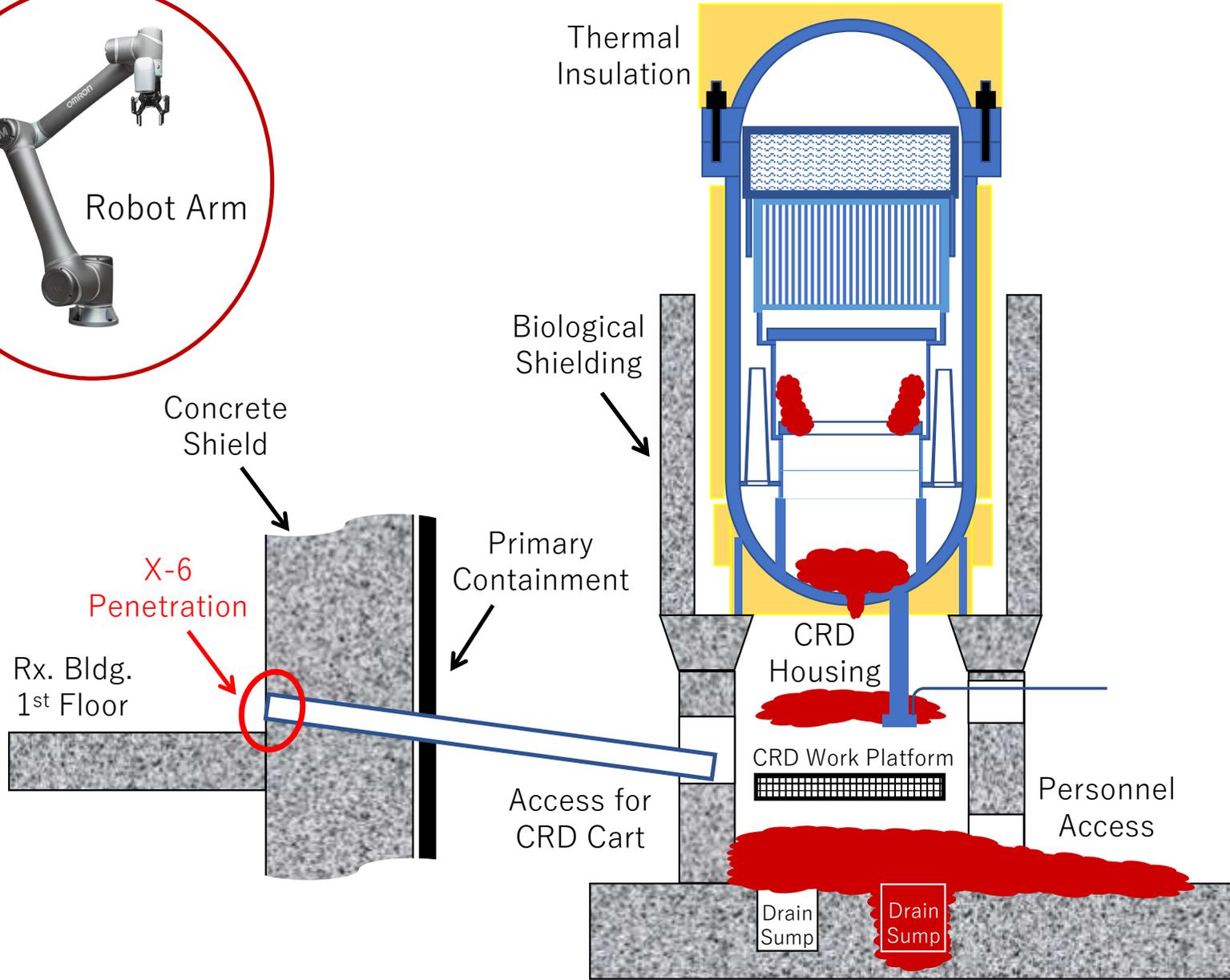
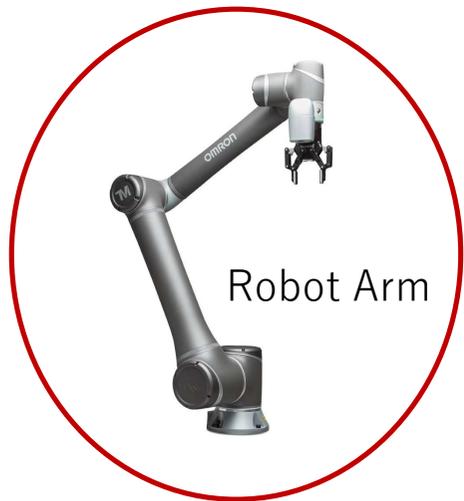
# Concept of Dry Island



# Fuel Debris Generates Less Heat Than Human !?

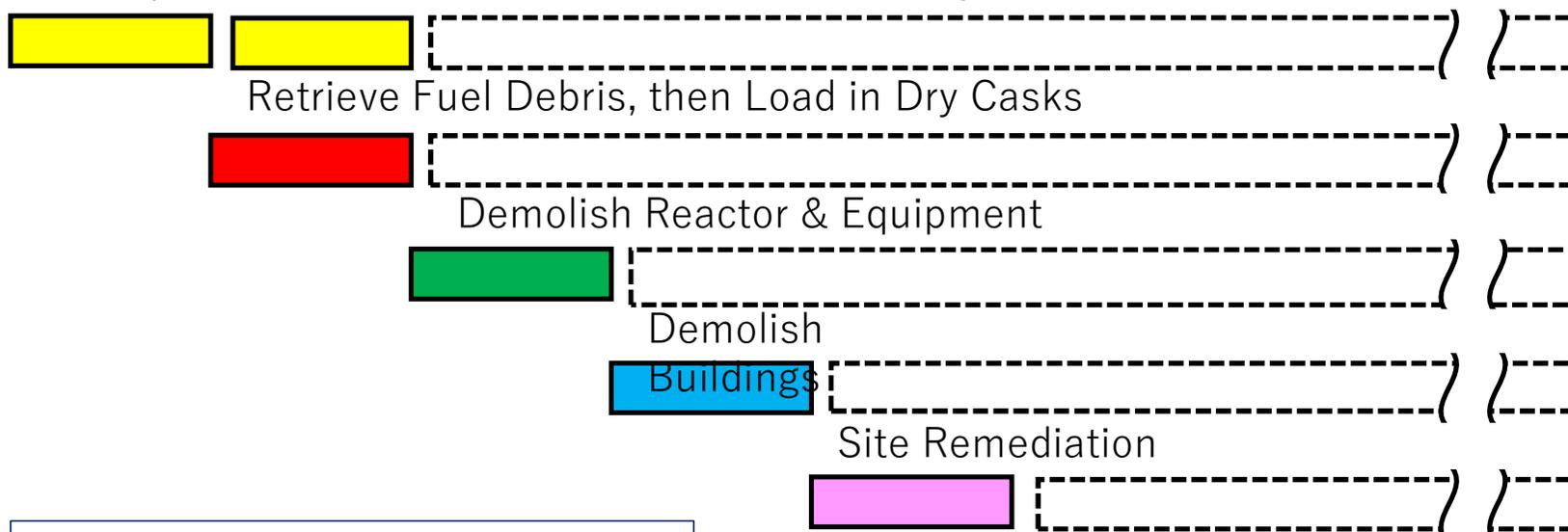


Human	Fuel Debris
125W	6.9 kW (Unit 2)
75kg	250t (Unit 2)
1.7W/kg	0.28W/kg



# Why the rush ?

Move Spent Fuel to Common Pool, then Load in Dry Casks



- Premature Technology
- More Exposure
- More Money (More Debt!!)
- More Risk
- And no Green Field anyway...

Long (Indefinite) Standby until Backend Policy has been developed and associated Infrastructure has become available.

**There is no solution for nuclear waste disposal in Japan (or anywhere)**

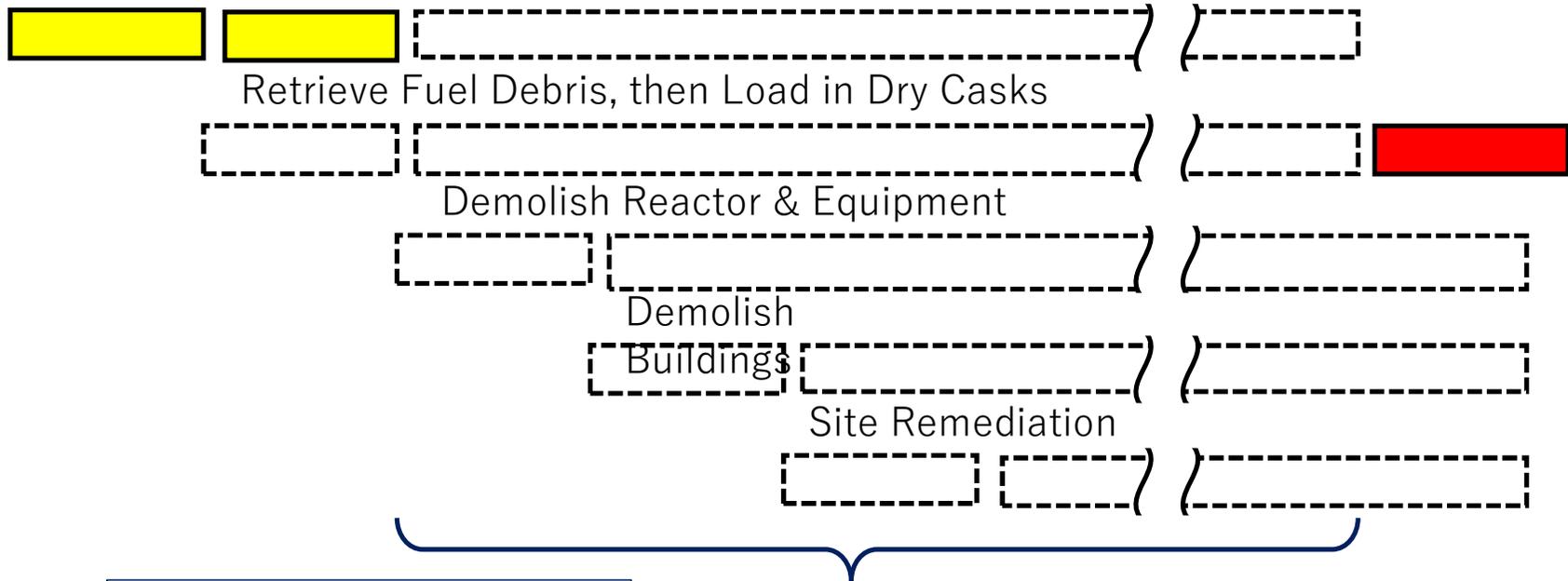
**Storage of high level waste for 300 years – Science Council of Japan, 2010**

In 2010, the Japanese Cabinet Office requested that the Science Council of Japan gives its analysis on the options for the disposal of high level nuclear waste. After reviewing the status of disposal research in Japan, the Council in September 2012 recommended to the then Government that interim storage of high level waste be considered for a period of 300 yrs. This is acknowledgment of the reality of the problem for high level waste management in Japan.



# This is a long term problem - so rethink

Move Spent Fuel to Common Pool, then Load in Dry Casks



Wait for :

- Advanced Technology
- Radiation Decay

Advantages :

- Saving Money
- Less Risk

50~100 years

### Comparison of Decommissioning Options

Option	TEPCO - Plan A	Sato - Fukushima Closure Plan	Plan B	Plan C
<b>Status</b>	Aborted by 2018	Disqualified by IRID in 2014	On-going plan developed by NDF	New Proposal
<b>End State</b>	Green Field	“Dry Island” isolated by moat as final disposal site	Green Field (?)	“Dry Island” isolated by moat as final disposal site
<b>Target Schedule</b>	40 Years	40 Years	40 Years	Indefinite
<b>Method to Isolate Ground-water Flow</b>	Frozen Wall + Pump	Moat	Frozen Wall + Pump	Moat + Enhanced Air / Water tightness
<b>Method to Cool Fuel Debris</b>	Water-Cooled	Air-Cooled	Decision Suspended	Air-Cooled
<b>Method of Fuel Debris Retrieval</b>	Flooded Top Access Extendable Mast	Underground Hot Cell Extendable Mast	Dry Lateral Access Multi-Axis Arm Robot	Humanoid Robot Human Body Motion
<b>Method to Dismantle RPV</b>		Not Discussed	Not Discussed	Leave As-is after Decontamination (Partially Dismantled)
<b>Dismantling PCV, Rx. Bldg.</b>	Not Discussed	Not Discussed	Not Discussed	Leave As-is after Decontamination (Partially Dismantled)
<b>Achievability</b>	Extremely Difficult Uachievable	Difficult Achievable	Extremely Difficult (Unknown)	Presumably Easy
<b>Safety / Exposure</b>	Unacceptably Dangerous	Less Exposure	More Exposure	Minimum Exposure

The above table shows the options for each of the main challenges at the Fukushima Daiichi site.

A new strategic plan is inevitable – the sooner the better

