

April 6, 2018
Environmental Preservation Division
Department of Environment Affairs
Okinawa Prefectural Government

**Survey of Perfluorinated Compounds in the Environmental Water in Okinawa
(Result of Winter Survey in Fiscal Year 2017)**

Results of Survey

Okinawa Prefectural Government (OPG) has been conducting a survey of perfluorinated compounds in the environmental water of the prefecture since August 2016 in order to assess perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) levels in groundwater. The results of the most recent analysis of 19 samples from various sites (See Appendix 1) are listed in Appendix 2. The detected values of perfluorinated compounds in these samples were almost the same as the results of a previous survey, although there was some fluctuation. There are no standards set for perfluorinated compounds in water in Japan, however the total concentration levels of PFOS and PFOA at 7 out of 18 samples in groundwater around Marine Corps Air Station (MCAS) Futenma were found to have exceeded lifetime health advisory levels for drinking water in the United States (hereinafter referred to as “recommended levels”).

The levels detected are not considered to be a problem as long as residents do not drink the groundwater directly. In this summer survey, OPG conducted sampling and analysis of surface water around MCAS Futenma; it was confirmed that the concentration of PFOS and PFOA in surface water flowing into the air station is low. OPG will continue to monitor relatively high concentrations points to assess the situation.

Reference Material

The standards of PFOS and PFOA

○Japan(There are no standard.)

Ministry of Health, Labor and Welfare : Items should be examined with regard to tapping water (2009)

Desired amount has not been set both on PFOS or PFOA

Ministry of Environment : Items which require research for programs on conservation of aquatic environment (March, 2014)

Although PFOS and PFOA are marked to be researched, neither standards nor advisories among others are set.

○The United States

Lifetime Health Advisories in drinking water

2016 : Total amount of PFOS and PFOA 70 ng/L

○Germany

Lifetime Health Advisories in drinking water

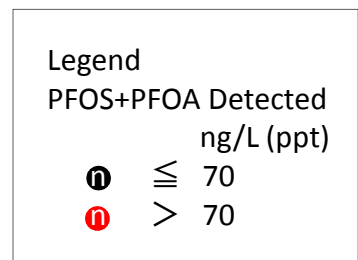
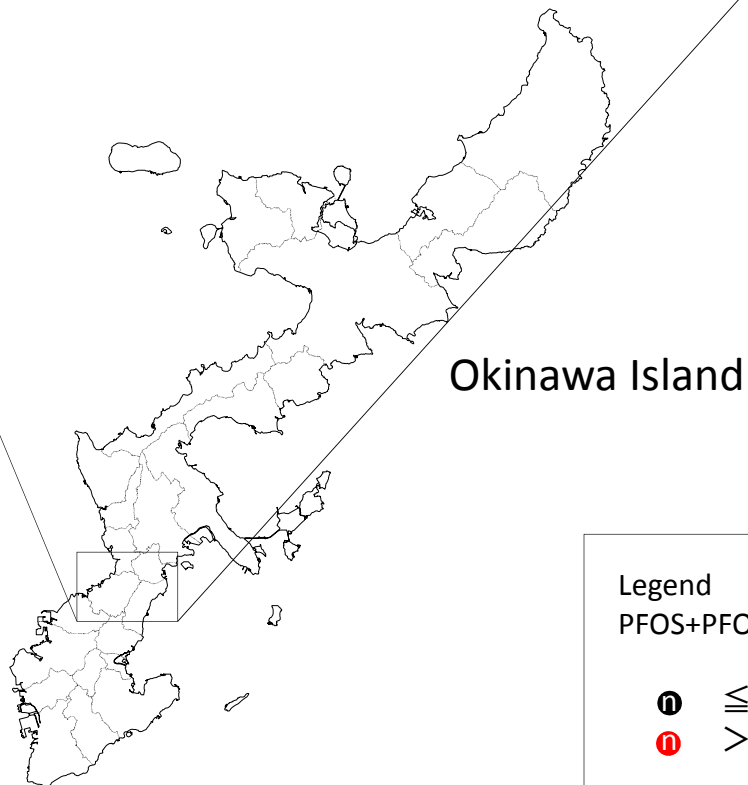
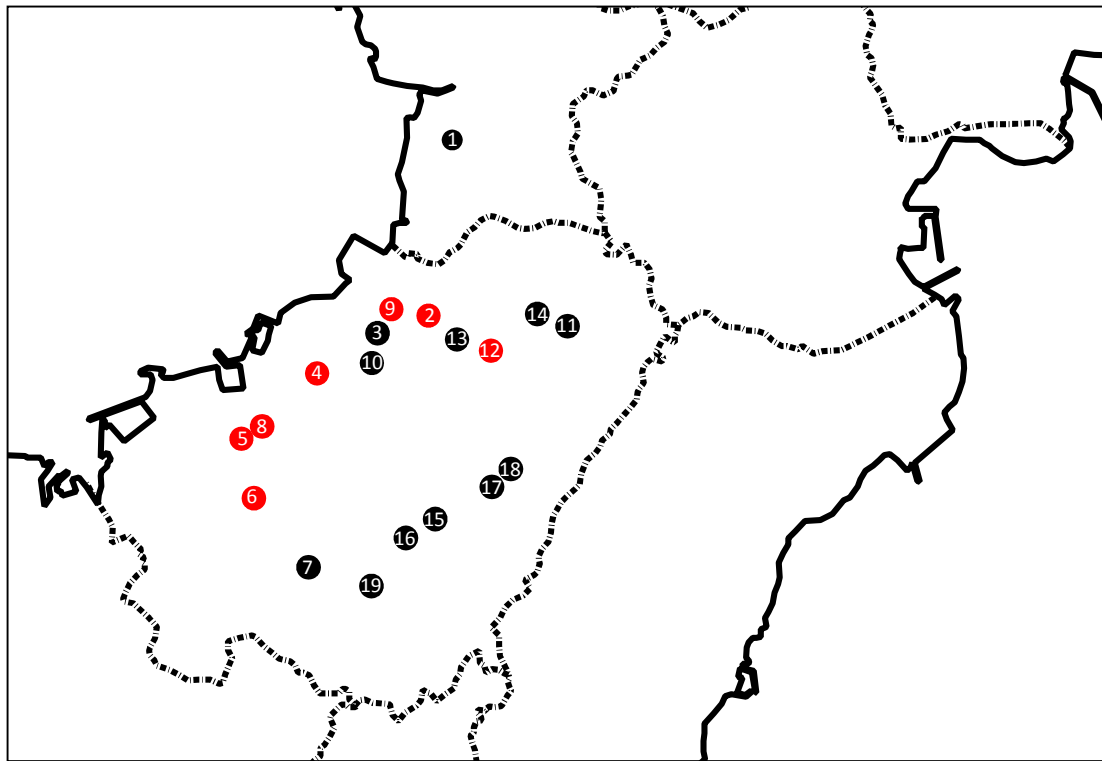
2006 : Total amount of PFOS and PFOA 300 ng/L

About PFOS and PFOA

- PFOS stands for Per Fluoro Octane Sulfonate while PFOA stands for Per Fluoro Octanoic Acid. Both of them are one of organofluorine compounds. Because PFOS and PFOA possess hydrophobicity nature (a feature to repel water) and oleophobicity nature (a feature to repel oil), they had been widely used for fire foam, water repellents and antifouling agents, etc.
- PFOS is mainly used for fire foam, plating solution, aircraft hydraulic oil, water repellent and floor wax, etc. However, the authorized use of PFOS is currently limited to production of etching solutions and semiconductor resist and business purpose photographic films as the essential use which cannot be replaced with substitutes. The use of PFOS for any other purposes than those mentioned above are prohibited. PFOA is used for producing fluoroplastics. It has not been a target of regulation at the present moment, however it is expected to be regulated in the same way as PFOS in the future. Please note that fire foam is not subject to essential use of PFOS, however the use of PFOS for fire foam is permitted on the

condition that its producers must set the technical standards in handling PFOS and make them public in order to prevent the environment of pollution. Yet, it is recommended to replace with substitutes.

- PFOS and PFOA are hardly decomposed in the environment. Therefore, its persistence in the environment as well as its accumulation in the living organisms are considered to be problematic and have been an object to regulation as new environmental pollutants. Following that Lifetime Health Advisories in regard to drinking water in the U.S. is now based on the total of PFOS and PFOA, the research should be conducted on these two substances.



Result of Winter Survey in Fiscal Year 2017

Analysis Items Perfluorooctane sulfonate (PFOS)/Perfluorooctanoic Acid (PFOA)
 Subject Water quality

Result List			Summer Survey(JFY2016) (ng/L)			Winter Survey(JFY2016) (ng/L)			Summer Survey(JFY2017) (ng/L)			Winter Survey(JFY2017) (ng/L)					
			PFOS	PFOA	Total Value	PFOS	PFOA	Total Value	PFOS	PFOA	Total Value	PFOS	PFOA	Total Value			
①	Chatan Town	Surrounding area of Camp Zukeran, Western Drainage	30	11	41	57	7.5	64	29	9.1	38	30	8.0	38			
②	Ginowan City	Surrounding area of Futenma Air Station, Chunnaga (spring)	1200	190	1300	730	150	880	740	140	880	900	130	1000			
③	Ginowan City	Surrounding area of Futenma Air Station, Hunshinga (spring)	38	21	59	39	22	61	37	25	62	39	22	61			
④	Ginowan City	Surrounding area of Futenma Air Station, Hiyakaga (spring)	180	31	210	94	26	120	120	33	150	160	36	190			
⑤	Ginowan City	Surrounding area of Futenma Air Station, Mendakarihiga (spring)	680	35	710	670	42	710	590	43	630	640	42	680			
⑥	Ginowan City	Surrounding area of Futenma Air Station, Morinokawa (spring)	30	9.4	39	40	5.4	45	39	11	50	71	25	96			
⑦	Ginowan City	Surrounding area of Futenma Air Station, Samashita Ubuga (spring)	24	9.0	33	30	11	41	18	8.8	26	13	7.2	20			
⑧	Ginowan City	Surrounding area of Futenma Air Station, Ogumuya (spring)	No measurement data available for this location.			550	21	570	43	16	59	90	18	100			
⑨	Ginowan City	Surrounding area of Futenma Air Station, Isaufuga (spring)				130	62	190	120	35	150	250	42	290			
⑩	Ginowan City	Surrounding area of Futenma Air Station, Furuchinga (spring)				96	22	110	66	17	83	49	14	63			
⑪	Ginowan City	Surrounding area of Futenma Air Station, Aragusuku A (groundwater)				15	4.4	19	17	4.8	21						
⑫	Ginowan City	Surrounding are Futenma Air Station, Kyuna A (groundwater)				260	26	280	320	29	340						
⑬	Ginowan City	Surrounding area Futenma Air Station, Kyuna B (groundwater)				40	31	71	34	23	57						
⑭	Ginowan City	Surrounding area Futenma Air Station, Aragusuku B (groundwater)				40	15	55	35	12	47						
⑮	Ginowan City	Surrounding area of Futenma Air Station, In Civic Park (Upstream Surface-Water)				6.6	3.8	10	11	4.6	15	6.9	3.9	10			
⑯	Ginowan City	Surrounding area of Futenma Air Station, Ginowan Kumaibu Ritual Site (spring)				7.2	3.9	11	6.7	3.0	9.7	11	5.5	16	6.2	3.5	9.0
⑰	Ginowan City	Surrounding area of Futenma Air Station,Kamiyama・Aichi Nuruga (spring)				0.12	<0.04	0.16	0.15	0.04	0.19	0.17	0.15	0.32			
⑱	Ginowan City	Surrounding area of Futenma Air Station, Akamichi (Upstream Surface-Water)	12	4.1	16	11	5.1	16	7.8	4.7	12						
⑲	Ginowan City	Surrounding area of Futenma Air Station, Ginowan (groundwater)										0.60	0.77	1.3			

(Note) The results of measurement are shown in two effective digits (disregarding the third digit) in accordance with "Designation of Water Type in Environmental Standards Based on the Environmental Basic Law and Processing Standards Including Continuous Monitoring Based on the Water Pollution Prevention Act (Ref. 1303271 of March 27,2013)." When the total value was below the lowest detectable limit, the detectable value, 0.04ng/L is used to calculate the value.