

Human Sera/Medical Surveillance/Epidemiology

- 1) Memorandum from D.E. Roach and S.D. Sorenson, 1983 Decatur Blood Fluoride Review, January 20, 1984
- 2) Antwerp Blood Testing Results from June 1995, by Jeffrey H. Mandel, M.D., M.P.H., and Jean Burris, R.N., O.H.N., M.P.H., November 6, 1995
- 3) Analysis of Serum Values in Decatur Workers, prepared by Michel Burlew for Larry Zobel, M.D. and Jeffrey Mandel, M.D., April 2, 1998
- 4) Laboratory Report, Analysis of FCs in Samples of Children's Sera, Laboratory Report No. FACT-GEN-011, 3M Environmental Laboratory, May 21, 1999
- 5) Laboratory Composite Report, Analytical Reports of Data for Fluorochemical Analysis in Human Sera, LIMS No. 1623, 3M Environmental Laboratory, April 28, 2000

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Re J. H. WEBSTER - CHEMICAL SPECIALTY DIVISION - DECATUR

From D. E. ROACH - MEDICAL, MEDICAL SERVICES - 220-2E-02

B. D. SORENSON - MEDICAL, IND. HYG. SERV. - 220-2E-02

Subject 1983 Decatur Blood Fluoride Review

Date January 20, 1984

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This is to summarize the results of the 1983 organic fluorine-in blood-monitoring conducted as part of the continuing fluorochemical study program.

The concentration of organic fluorine in a person's blood is believed a function of the magnitude of past and current exposures and the rate of excretion. Monitoring of trends of organic fluorine concentrations in the blood can provide information on the extent of exposure and effectiveness of industrial hygiene controls.

The results of the blood monitoring for 1982 and 1983 are compared. The results are categorized by work area according to lists submitted by Opal Campbell. The comparison includes only those employees who participated in both 1982 and 1983. Those employees who participated in 1982 but not in 1983 are not included. Several employees who participated in 1983 and in earlier years, but not in 1982, are commented on separately.

Several employees were indicated as having transferred to another department sometime during the interim of the tests. Their results were compared in the original department to reduce complexity. The apparent slow excretion rate is believed to reduce possible bias to a very low amount.

Table I compares average OF concentrations by 1982 and 1983. The table also includes the range of OF concentrations found. The results indicate a continuing downward trend in nearly all production areas, but an apparent increase in Building two and Wastewater treatment.

J. E. WHESTER

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Table II is a depiction of the number of decreases, increases and OF concentrations that did not change. It should be noted that the precision of the analytical method in use is limited to ± 1 ppm at lower blood levels and may be greater at higher blood levels, therefore, the significance of 1 ppm changes may be limited. Both total changes and changes greater than 1 ppm are depicted. In either case, there are more decreases than increases.

Table III summarizes the number of employees in each area by OF concentration. The number include all employees tested in 1983. Supervisors from the indicated areas were included in the totals. It can be seen that the majority of employees have OF concentrations less than 5 ppm.

Table IV includes additional comments on results not included in the data comparisons. The results commented upon indicate a downward trend.

In conclusion, most areas have experienced a downward trend. Insufficient evidence exists to determine the excretion rate or whether all persons excrete at the same rate. The data is believed to be indicating that improved exposure controls are having a positive effect. It is recommended that areas not exhibiting a decline be especially reviewed for exposure potential and feasible improved control measures. While all studies to date fail to demonstrate human disease or patterns of adverse effect associated with organic fluorine concentrations in the blood, it is imperative that we continue every effort to reduce exposure and OF levels to the lowest degree possible.

SDS/DER/cr

S. D. Spencer
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TABLE I

Organic Fluorine Blood Concentration, PPM

	<u>Number</u>	<u>Average</u>		<u>Range</u>	
		<u>1982</u>	<u>1983</u>	<u>1982</u>	<u>1983</u>
Bldg 2					
Supervisors	1	2	2		
Operators	12	3.1	3.5	< 1-8	2-8
Bldg 3 West					
Supervisors	1	5	5		
Operators	25	9.0	7.4	2-23	2-15
Bldg 3 North					
Supervisors	4	5.8	4.3	4-7	3-6
Operators	21	6.9	6.6	2-12	2-12
Bldg 3 East					
Supervisors	3	5	5	4-6	-
Operators	24	5.1	4.9	1-12	1-15
Bldg 4 North					
Supervisors	3	3	3.3	1-4	3-4
Operators	34	2.9	2.7	< 1-9	< 1-6
Bldg 4 South					
Supervisors	3	2.3	3	2-3	2-4
Operators	25	4.1	3.9	< 1-20	< 1-20
Maintenance					
Shop	8	0.9	0.8	< 1-2	< 1-2
All Bldgs	16	1.8	1.6	< 1-3	< 1-5
Bldg 3	5	6.8	5.6	< 1-12	3-11
Bldg 2 & 4	6	2.5	2.3	1-5	< 1-4
Wastewater Treatment	4	2.8	3.3	2-4	1-6
Boiler house	2	2.5	< 1	2-3	< 1-1
Laboratory	19	1.1	1.2	< 1-3	< 1-4
Process Engineering	4	< 1	< 1	< 1	< 1-1

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TABLE II

Number of Increases and Decreases

	<u>Number of Increases and Decreases</u>			<u>Number of Changes More Than 1 PPM</u>	
	<u>Decrease</u>	<u>Increase</u>	<u>No Change</u>	<u>Decrease</u>	<u>Increase</u>
Bldg 2					
Supervisors	-	-	1	-	
Operators	1	5	6		1
Bldg 3 West					
Supervisors	-	-	1		
Operators	17	4	4	10	1
Bldg 3 North					
Supervisors	3	-	1		
Operators	11	7	3	4	4
Bldg 4 North					
Supervisors	1	1	1		
Operators	12	6	16	4	2
Bldg. 4 South					
Supervisors	-	2	1		
Operators	9	8	8	3	2
Maintenance					
Shop	-	2	6		
All Bldgs	8	4	4		1
Bldg 3	4	-	1	2	2
Bldg 2 & 4	3	1	2	2	-
Wastewater Treatment				1	1
Boiler house					
	2	-	-	2	-
Laboratory	5	7	7	1	1
Process Engineering	-	2	2	-	-

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TABLE III

OF Concentration: All Production Employees Tested in July, 1983
Number of Employees

	<u>0-5 PPM</u>	<u>6-10 PPM</u>	<u>11-15 PPM</u>	<u>16-20 PPM</u>
Bldg. 2	12	1		
Bldg. 3 West	11	9	6	
North	12	14	2	
East	19	10	1	
Bldg. 4 North	37	1		
South	27	4		1
Maintenance - Shop	8			
All Bldgs.	16			
Bldg. 3	5			
Bldgs. 2 & 4	6			
Waste Water Treatment	6	1		
Boiler House	2			
Laboratory	25			
Process Engineering	9			

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TABLE IV

Comments - Additional Test Results

Building 3 West	2 employees last tested 1981 1 declined from 12 to 11, 1 from 14 to 7
3 North	1 employee last tested 1981 declined from 10-11 1 employee last tested 1980 declined from 9-3
3 East	2 employees last tested 1981 declined from 3 to 2 and 5 to 3; 1 last tested 1980 declined from 8 to 6
4 North	2 employees last tested 1981 declined from 6 to 3 and increased from <1 to 1
4 South	3 employees last tested 1981; 1 showed no change, 2 declined 3 to <1, 6 to 5. 1 employee with OF level of 20 worked in Bldg. 3W until 1981
Maintenance - Bldg. 3	2 employees last tested in 1981 declined 4 to 3 and 5 to 3
Waste Water Treatment	3 employees last tested 1981; 2 no change 1 declined from 3 to 1

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