PLAINTIFF'S EXHIBIT

UC-5362

UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA

CONWED CORPORATION,

Civil Action No. 5-92-88

Plaintiff,

v.

UNION CARBIDE CHEMICALS AND PLASTICS COMPANY, INC.,

Defendant and
Third-Party Plaintiff,

v.

OWENS-CORNING FIBERGLAS CORPORATION, ET AL.,

Third-Party Defendants.

AFFIDAVIT OF DR. ARTHUR M. LANGER

STATE OF NEW YORK)
) ss.
COUNTY OF WESTCHESTER)

Dr. Arthur M. Langer, being duly sworn upon oath, states as follows:

1. I am a mineralogist with a concentration and specialty in asbestos mineralogy. Over the past 35-years I have focused my research on the biological effects of mineral dust, especially asbestos, and have published many of these studies in medical and biological journals. See my publications in my attached curriculum vitae, Exhibit 1.

2. I am the Deputy Executive Officer of the Ph.D. Program in Earth and Environmental Sciences at the Graduate School and University Center of the City University of New York and I also serve as Director-Environmental Sciences Laboratory located on the Brooklyn College campus of the City University of New York.

3. A copy of my curriculum vitae, containing a list of my former appointments and positions in the Mount Sinai School of Medicine, is attached hereto as Exhibit 1

4. I have been retained by Conwed Corporation as an expert witness in the above matter and will testify, among other things, specifically about Union Carbide's marketed asbestos, trade name Calidria, mined and extracted from the serpentine ore body near the towns of Coalinga and New Idria, California.

5. My deposition was taken by Trevor Will, counsel for defendant Union Carbide Chemicals and Plastic, Inc. on four occasions on 01/14/94, 05/25/94, 09/16/98, and 11/19/98. The deposition transcript totaled 712 pages and included 21 exhibits. At that deposition, my opinions in this matter, together with the bases therefore, were fully explored.

6. One of the matters upon which I expect to testify at trial is the amount of asbestos used at Conwed's Cloquet, Minnesota ceiling tile plant. I have reviewed all available records of asbestos purchases to that plant and have quantified the amount of asbestos used in the plant on the attached bar graph, Exhibit 2. The darker colored bar on that exhibit shows shipments of the Union Carbide Calidria chrysotile asbestos product from Union Carbide's mine in King City, California to Conwed's plant in Cloquet, Minnesota.

7. I also expect to testify at trial concerning the exposure of Conwed workers in the Cloquet ceiling tile plant to airborne asbestos dust generated by use of the Union Carbide Calidria chrysotile asbestos in the plant. My opinion as to the amount of such airborne asbestos dust is based upon, among other things, the following information; the physical, chemical, morphological, and electrical charge characteristics of Union Carbide Calidria chrysotile asbestos, the size, and size distribution, of the Calidria chrysotile asbestos fibers, experimental data carried on in my own laboratory concerning airborne asbestos fiber concentrations from Union Carbide Calidria chrysotile asbestos, similar tests carried out by Union Carbide at its research laboratory in Niagara Falls, New York concerning airborne fiber concentrations of Union Carbide Calidria chrysotile asbestos, and a thorough review of the extensive airborne Calidria asbestos dust monitoring conducted by Union Carbide at its Calidria asbestos customers' locations, including Conwed, over a period of many years, which data has been collected and provided by Union Carbide through discovery in this matter.

8. Based upon these data, it is my opinion that airborne asbestos fibers, also known as a fiber aerosol, within the Conwed plant, during production use of Union Carbide Calidria chrysotile asbestos, from 1965 to 1974, probably resulted in substantial and significant asbestos exposure to the Conwed workers.

9. In summary, the data supporting this conclusion, described above, includes the following:

10. Union Carbide's own airborne asbestos airborne dust simulation study conducted in its research laboratory at Niagara Falls, New York, which shows an airborne

asbestos dust level ranging from 12.9 fibers greater than 5 microns in length per cubic centimeter (f/cc) of air to 43.4 f/cc of air.

11. Dust measurements during the bagging operations at Union Carbide's mill in King City, California reveal an airborne asbestos fiber level greater than 5 microns in length ranging from 3.3 f/cc of air to 9.6 f/cc of air, with high exposures to 23.7 f/cc of air.

12. A study of Union Carbide Calidria chrysotile asbestos in my laboratory at the Environmental Sciences laboratory in New York showed an airborne asbestos fiber level of 26.5 f/cc of air of fibers greater than 5 microns in length when analyzed by phase contrast (light optical) microscopy and 83.8 f/cc of air when analyzed by transmission electron microscopy.

13. The only measurements taken by Union Carbide at Conwed's ceiling tile plant in Cloquet, Minnesota were conducted by Union Carbide personnel in August, 1972, by optical light microscopy, and showed an average airborne asbestos fiber level of 1.9 f/cc of air, greater than 5 microns in length, with a high of 5.5 f/cc of air, on personnel samples taken.

14. In contrast, Union Carbide has taken hundreds of airborne asbestos fiber measurements at other Union Carbide customers' plants, on the same or similar manufacturing operations, which are more representative of average airborne fiber levels over time. In contrast to the 15 samples Union Carbide took in Cloquet, I have carefully examined 479 measurements taken by Union Carbide personnel, with the same optical microscopy techniques they used at Conwed's plant, over the time period from 1972 to 1985. A representative sample of those

measurements, in operations the same or similar to those employed by workers in Conwed's plant, from 1971 to 1976, is as follows (given as fibers greater than 5 microns in length):

AIR LEVELS MEASURED IN SOME INDUSTRIES USING CALIDRIA CHRYSOTILE FIBER 1971-1976

Activity	Average f/cc of air	Highest Value
Boxcar Loading and Unloading	4.7	9.6
Dumping Bags of Pellets	12.5	31.4
Dumping Bags of Pellets	31.4	69.6
Industrial Process	12.9	26.1
Cutting, Trimming of Product	13.2	18.0
Personal (Employees)	18.0	44.5
Environment in Plant	2.8	22.2

15. In comparison, the Occupational Safety and Health Administration (OSHA) adopted its airborne asbestos fiber standard which applied to workplaces, in 1972. That standard, which applies to Union Carbide Calidria chrysotile asbestos, and its permissible exposure levels in the workplace, is as follows:

Years	Permissible Exposure Level Asbestos Fibers Greater Than 5 Microns in Length	
1972-1976	OSHA Workplace Asbestos Standard	5.0 f/cc of air
1976-1986	OSHA Workplace Asbestos Standard	2.0 f/cc of air
1986-1992	OSHA Workplace Asbestos Standard	0.2 f/cc of air
1992-2000	OSHA Workplace Asbestos Standard	0.1 f/cc of air

16. By way of comparison, historical levels of airborne asbestos fiber found in U.S. cities, based partly upon my own research, is less than 0.0001 f/cc of air, historical levels found in the air in U.S. buildings, containing asbestos-containing materials, is 0.0005 f/cc of air, and the U.S Environmental Protection Agency (EPA)

contractor release level (the permissible level of asbestos in the air following an asbestos abatement in buildings), is 0.005 f/cc of air.

17. Based upon these data, and other data as described more fully in my deposition taken in this case, I will testify at trial that the workers in Conwed's Cloquet, Minnesota ceiling tile plant were exposed to substantial and significant amounts of Union Carbide Calidria asbestos throughout the years the Union Carbide Calidria asbestos was used in that plant from 1965 to 1974.

18. Union Carbide Calidria chrysotile asbestos is neither a safe nor benign asbestos type, as Union Carbide appears to contend in its motion. A substantial body of research, as described in my deposition, indicates it is not only harmful, it may be more harmful than chrysotile mined at other geological locales. Attached as Exhibit 3, is a copy of a paper entitled *Cytotoxicity of a Short-Fiber Chrysotile Asbestos for Human Alveolar Macrophages: Preliminary Observations*, of which I was an author, published in the peer reviewed scientific literature, which describes more severe effects from Union Carbide Calidria chrysotile asbestos on live human lung macrophage cell cultures, than produced by other asbestos types.

FURTHER YOUR AFFIANT SAYETH NOT.

Dr. Arthur M. Langer

Subscribed and sworn to before me
this 25th day of Sept, 2000.

Notary Public

TEJINDER SINGH
NOTARY PUBLIC, STATE OF N.Y.
#0154736189, Exp. 12/31/2000
Qualified in Westchester County