

ASSESSMENT OF THE OFFICIAL AIR SAMPLING EQUIPMENT
AT ROCKY FLATS NUCLEAR WEAPONS PLANT DURING 1974 TO 1976,
BEARING ON THE CURRENT CONCERNS ABOUT THE JEFFERSON
PARKWAY PLAN FOR ROAD CONSTRUCTION.

Harvey Nichols, Ph.D. Emeritus Professor of Biology, February 18, 2012

In 1974 I was asked by Dr. William Osburn of ERDA/DOE to research the airborne particles at Rocky Flats, which I performed under contract EY-76-S-02-2736 during 1975-6.

The deficiencies of the air sampling equipment were obvious to me, even from a distance, on the first day I visited Rocky Flats in company with Dr. William Osburn (ERDA/DOE). These were the Anderson Samplers and the Low Volume Air Samplers located around the perimeter of the nuclear weapons site, and I noted that they were roofed and were not isokinetic. My own previous experimental work on long-distance airborne exotic pollen in the Canadian arctic had shown me that the mere presence of an open-sided roof over an open-aperture static Tauber pollen sampler was sufficient to greatly reduce the numbers of particularly lightweight conifer pollen deposited (see below), compared to nearby unroofed Tauber samplers which I had set up for comparison at a site in the arctic.

Isokinetic samplers turn to meet the wind (like a weather vane), but the Rocky Flats samplers were fixed, immobile. Another characteristic of isokinesis involves the automatic adjustment of the airflow into the sampling chamber so that the intake speed matches the wind speed, avoiding having too little ambient air intake to be representative, or having too much (analogous to overfilling a glass with fluid). So the Rocky Flats air samplers were deficient in this respect also.

Later as I observed the operation of these official air samplers after high wind conditions I noted that numbers of the samplers were largely covered in dust, especially those at a height of about one meter above the soil surface. The Rocky Flats are notoriously windy (cf. the sign on Route 93 nearby warning of prevalence of high winds) and the effect was obviously to overwhelm the filters inside with sand and finer dust and thus to vitiate the sampling effectiveness

I learned too from Rocky Flats personnel that the perimeter air sampler filters were normally changed at two week intervals, and that their analyses were made some days later than that. Thus there was no ability by these samplers to register 'real-time' excursions of e.g. plutonium dust emissions from the Rocky Flats plant operations, and no capability to warn plant operators or the public of hazardous events while they were ongoing or just past.

My own analyses were made primarily from the filters from the official Rocky Flats filters after they were analysed within the plant and were provided to me for my contract study of airborne aerosols at Rocky Flats. I also exposed microscope slides with sticky surfaces to

record the ambient “pollen rain” by standard palynological techniques. My analyses of the ambient “pollen rain” compared to that collected close by on the filters from the official samplers showed that the Rocky Flats perimeter air samplers were noticeably deficient in collecting the most lightweight pollen, especially of pine, which is noteworthy in the literature for falling especially slowly under gravity. Residents of the Colorado Front Range are familiar with the vast numbers of local Montane Forest pine pollen deposited on parked cars etc. as yellow dust and as the yellow rim around puddles in early summer. The unrepresentatively-low numbers of such pollen on the official filters illustrates the inadequacies of these sampling devices. Thus the smallest particles of plutonium in the sub-microscopic sizes I measured later at Rocky Flats when scavenged by snowfall would not have been accurately represented by the official samplers.

When I sampled freshly-fallen snow on Rocky Flats during the winter of 1975-6 during my DOE contract I analysed very great numbers of radionuclide particles (as ‘star bursts’ and ‘fission tracks’ on alpha sensitive film) in size ranges between 5 microns and 0.05 microns. These I deduced were scavenged by falling snow from the stack effluent issuing from the nearby nuclear operations, and the particles I also now deduce were primarily plutonium, since Rockwell International staff admitted under my questioning at the State Legislature (9/30/1987) that they regularly emitted large numbers of tiny particles of plutonium from their stacks during routine operations at Rocky Flats. These deductions are supported by Dr. John Till’s analysis of DOE data that revealed that a minimum of over 600 million nano-curies of plutonium were so emitted at Rocky Flats. This again points up the sheer inefficiency of the official perimeter samplers which were designed to be covered by roofs. They could not collect the true quantity of plutonium dust escaping from the plant, being shielded from capturing fine particles which I demonstrated were scavenged from the air and deposited by snow and rain on the soil. When I asked EPA and US Fish and Wildlife Service what other comparative studies had been done by Rocky Flats scientists on snowfall particulates USFW replied in writing that I appeared to be the only person ever to have sampled snowfall for radionuclides at Rocky Flats (USFW letter 10/21/2003).

When I sampled freshly-fallen snow on Rocky Flats during the winter of 1975-6 during my DOE contract I analysed very great numbers of radionuclide particles (as ‘star bursts’ and ‘fission tracks’ on alpha sensitive film) in size ranges between 5 microns and 0.05 microns. These I deduced were scavenged by falling snow from the stack effluent issuing from the nearby nuclear operations, and the particles I also now deduce were primarily plutonium, since Rockwell International staff admitted under my questioning at the State Legislature (9/30/1987) that they regularly emitted large numbers of tiny particles of plutonium from their stacks during routine operations at Rocky Flats. These deductions are supported by Dr. John Till’s analysis of DOE data that revealed that a minimum of over 600 million nano-curies of plutonium were so emitted at Rocky Flats. This again points up the sheer inefficiency of the official perimeter samplers which were designed to be covered by roofs. They could not collect the true quantity of plutonium dust escaping from the plant, being shielded from capturing fine particles which I demonstrated were scavenged from the air and deposited by snow and rain on the soil. When I asked EPA and US Fish and Wildlife Service what other comparative studies had been done by Rocky Flats scientists on snowfall particulates USFW replied in writing that I appeared to be the only person ever to

have sampled snowfall for radionuclides at Rocky Flats (USFW letter 10/21/2003).

I note here that in 1975-6 and for many years afterwards I (and the public) was left unaware that there was routine plutonium dust emission from Rocky Flats, aware only that there had been oil-drum spillage of plutonium at the so-called "Hot Spot" which later was covered by asphalt, named the "903 Pad." The "hot" snowfalls that I sampled under contract were a mystery to me, as reflected in my Final Report to DOE (pages 4-5). Subsequent years of thinking about those data led me to ask DOE-contractor Rockwell officials at a Colorado House sub-committee hearing (recorded 9/30/1987, chaired by Rep. Dorothy Rupert) a key question (right after they had stated that there were no health implications from their operations at Rocky Flats): "Did you emit tiny quantities of very small particles of plutonium as part of your routine operations at Rocky Flats?" Answer from Rockwell: "Yes." This for me immediately explained the 'mystery' of the radioactive snow I sampled throughout the winter of 1975-6, which had repeatedly scavenged microscopic and sub-microscopic radionuclide particles from the air as gases were released by the stacks during the plant operations. This, from the Rockwell admission, must have occurred throughout the 1952 to 1989 nuclear weapons production, as shown by Dr. J. Till's study (paragraph 7 above).

All these deficiencies raise questions which demand action on sophisticated air sampling at Rocky Flats to safeguard public health, before development proceeds.

Based on the foregoing, I concluded that the results of air sampling at Rocky Flats routinely reported by government agencies responsible for air sampling on and off the site seriously misrepresented the quantity of minute airborne plutonium particles released from the plant. Their air sampling operation looked to me like a program to reassure the public rather than the sound, unimpeachable scientific endeavor that was actually needed.