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**Environmental Monitoring  
at Hanford for 1984  
Supplement**

**K. R. Price  
J. M. V. Carlile  
R. L. Dirkes**

**R. E. Jaquish  
M. S. Trevathan  
R. K. Woodruff**

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**January 1986**

**Prepared for the U.S. Department of Energy  
under Contract DE-AC06-76RLO 1830**

**Pacific Northwest Laboratory  
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# **Environmental Monitoring at Hanford For 1984**

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Richland, Washington 99352



**Supplement to PNL-5407**  
**Environmental Monitoring at Hanford for 1984**  
**EFFLUENTS, WASTE DISPOSAL AND UNUSUAL OCCURRENCES, p. 54**

**MONITORING IN RESPONSE TO THE RANGE FIRE  
ON THE HANFORD SITE OF AUGUST 10-12, 1984.**

**A range fire started on private land on August 10, 1984, and burned northward onto the Department of Energy's Hanford Site. Environmental monitoring results from air samples collected during and after the fire indicated that no radioactive materials different from normal levels were present in the air.**

**Background**

On the night of August 10, a range fire started on private land west of the Hanford Site and northeast of Sunnyside, Washington. On August 11, and the morning of August 12, the fire burned onto the Hanford Site and through the Arid Lands Ecology (ALE) Reserve up to the west side of Highway 240. At 1:00 p.m., on Sunday, August 12, the winds increased and the fire crossed Highway 240. Within a half hour, the fire reached the Army Loop Road. The fire continued in an easterly direction, also spreading north and south. The extent of the fire is shown on the map in Figure 1. In addition to local firefighting efforts, the Governor was notified and the National Guard was placed on standby. The fire burned approximately 200,000 acres of the Hanford Site. It did not burn into any of the four active operating areas or active waste disposal sites.

**Meteorology**

During the morning of August 12, 1984, winds over the northwest half of the Hanford Site were generally light (less than 10 km/h) and variable. By early afternoon, winds had increased to 16-21 km/h and were blowing from the S and WSW. During this same time period (morning and early afternoon) winds over the southeast portion of the site were blowing from the S and SW at 19-27 km/h with gusts to 40 km/h.

By mid-afternoon the entire site was under a SSW to SW air flow with 19-27 km/h winds gusting to 40 km/h. During the late afternoon, winds were blowing from the WSW to WNW at 24-40 km/h with gusts 48-56 km/h. By 6:00 p.m., the site

was under a W to WNW air flow with wind speeds of 24-40 km/h, and gusting to 64 km/h. At 8:00 p.m., the entire area was under a NW flow and wind speeds were beginning to decrease to 16-32 km/h with gusts to 40-48 km/h. By midnight winds were less than 16 km/h blowing from the SW through WNW.

The wind fields over the Hanford Site for various times of the day on August 11-13, 1984, are shown in Figure 2.

**Radiation Monitoring**

On Sunday afternoon, the Department of Energy contacted Pacific Northwest Laboratory (PNL) to advise the environmental monitoring staff of the status of the fire. In response, PNL dispatched a Radiation Protection Technologist to determine, through radiation monitoring at various locations if any radioactive material was being released to the atmosphere. He reported to two offsite air sampling stations located downwind of the fire to check the filters using portable GM and PAM survey instruments. All radiation readings at these two stations (Sagehill and Ringold) revealed that no detectable radioactivity was present from the fire. Subsequent low-level laboratory analyses of these filters confirmed the field measurements.

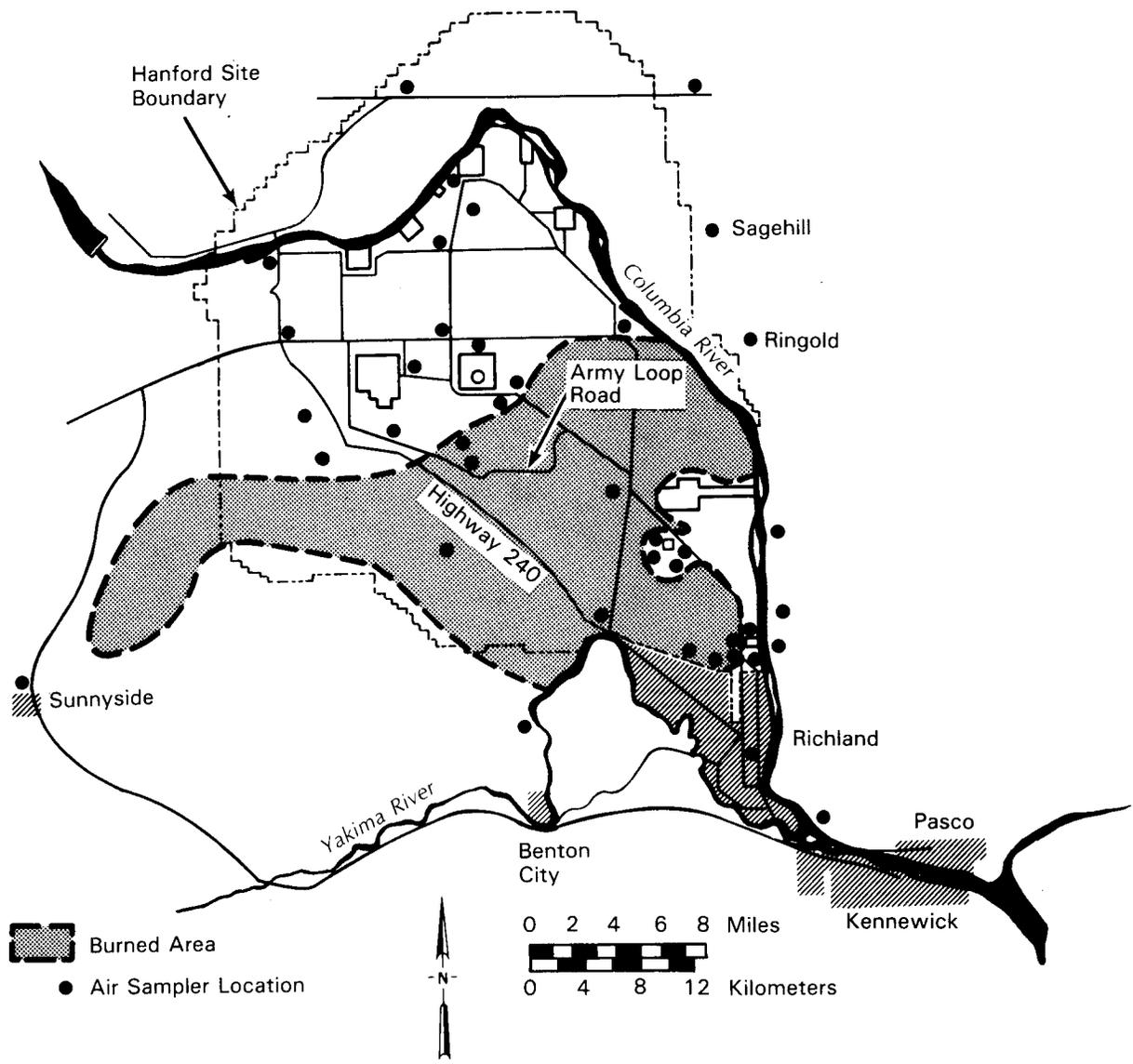
At the time of the fire, the routine air sampling network was in normal operation. This network is designed to detect particulates and gases in the air resulting from routine operations, unusual events, or external sources such as worldwide fallout. All the air sampling systems located onsite within the burn area were checked the day following the fire to assess fire damage. No significant damage was observed; however,

power to two stations was interrupted temporarily due to the power poles being burned down. The power was restored to these stations on August 14.

All air samples (particle filters) located onsite within the burn area and offsite in the downwind direction were collected within three days of the fire, with the exception of the Wye Barricade and Hanford Townsite, which were collected the following week. The analytical results on the air filters collected during this period did not indicate any concentrations of airborne radionuclides different from normal results. Subsequent analyses of the remaining particle filters also provided normal results. The average onsite gross alpha concentration during the fire period was 0.0016 pCi/m<sup>3</sup> and the gross beta was 0.020 pCi/m<sup>3</sup>. The average offsite gross alpha was 0.0012 pCi/m<sup>3</sup> and the gross beta was 0.018 pCi/m<sup>3</sup>. All results were incorporated in the values reported in Tables A.2 through A.10 of the 1984 annual report, PNL-5407.

To determine if <sup>14</sup>C was released to the atmosphere due to the burning of vegetation on the site, routine samples from the <sup>14</sup>C network were collected on August 14 and submitted for analysis. The results did not show any increase in levels of <sup>14</sup>C in air during the fire and were incorporated in the values reported in Tables A.3 through A.10 of the 1984 annual report, PNL-5407. The average <sup>14</sup>C concentration during the fire period was 1.1 pCi/m<sup>3</sup>. The 1984 annual average was 1.3 pCi/m<sup>3</sup>.

A farmer in the Ringold area was concerned about dust and ashes blowing from the Hanford Site onto his cherry trees after the fire. A PNL staff member visited the farm to observe the conditions and collect a sample of cherry leaves. The sample was analyzed and the results showed no detectable radionuclides.



**FIGURE 1.** Extent of Fire and Air Sampling Locations

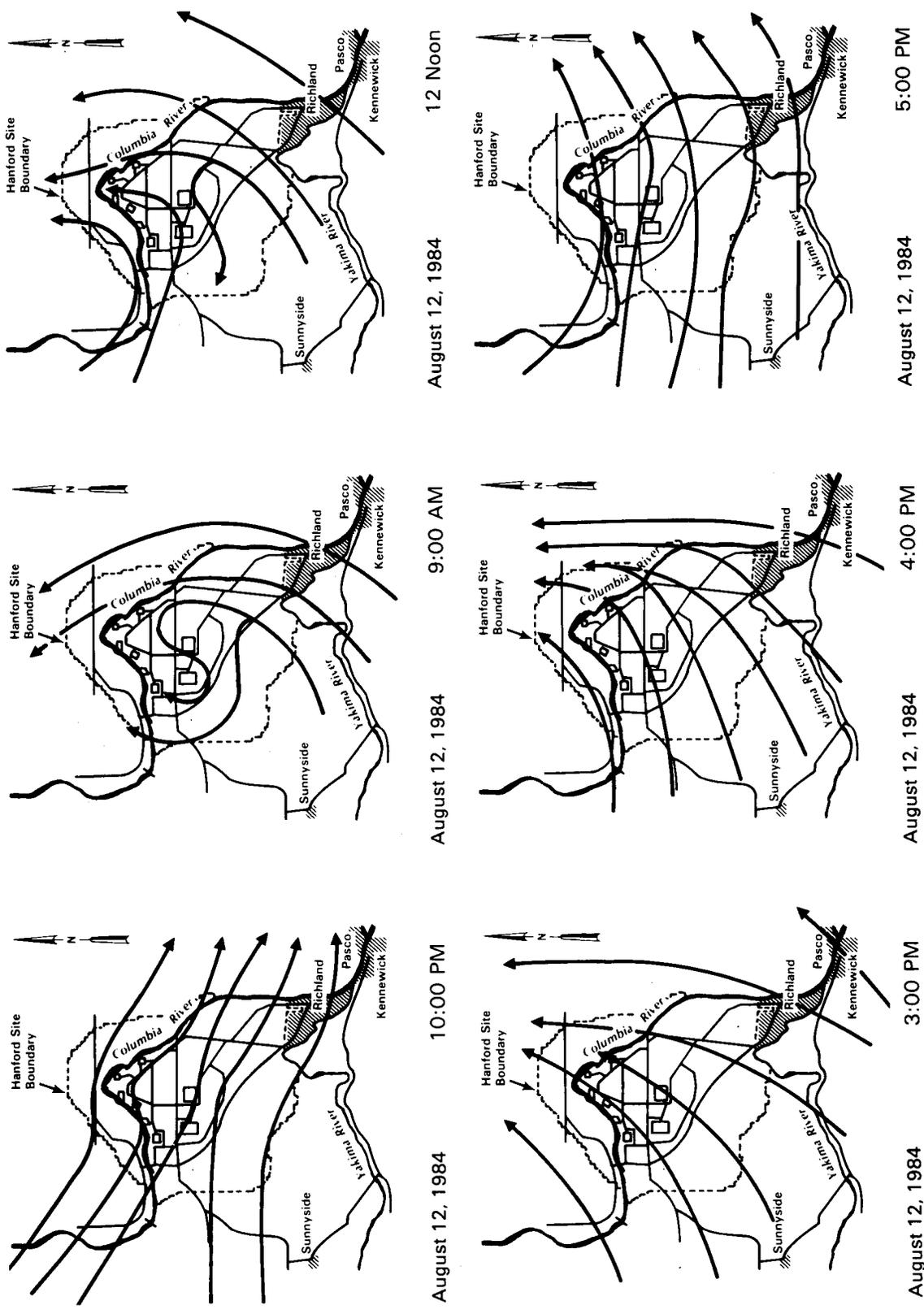
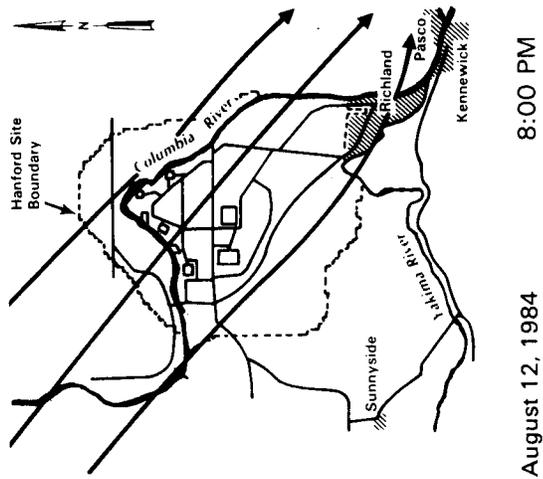
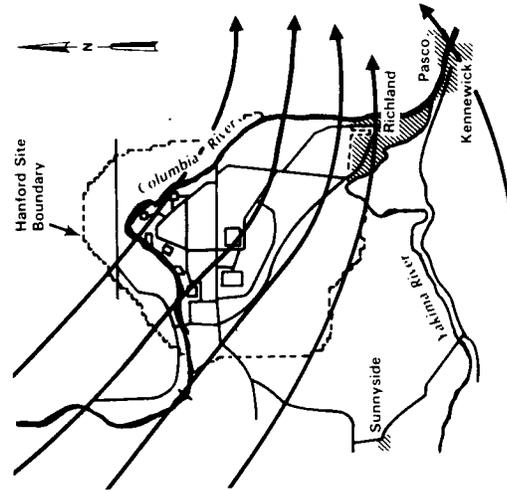


FIGURE 2. Wind Fields Over the Hanford Site, August 11-13, 1985



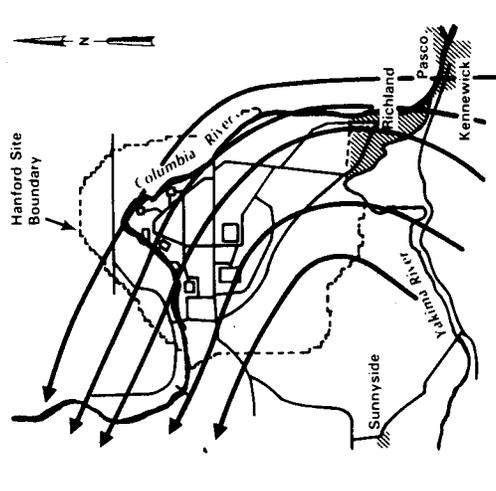
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August 12, 1984



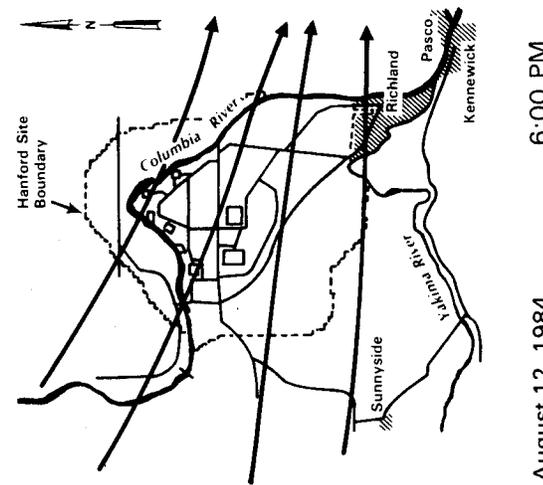
7:00 PM

August 12, 1984



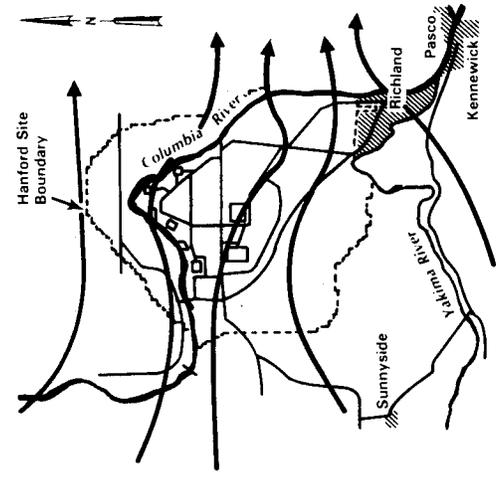
12:00 Noon

August 12, 1984



6:00 PM

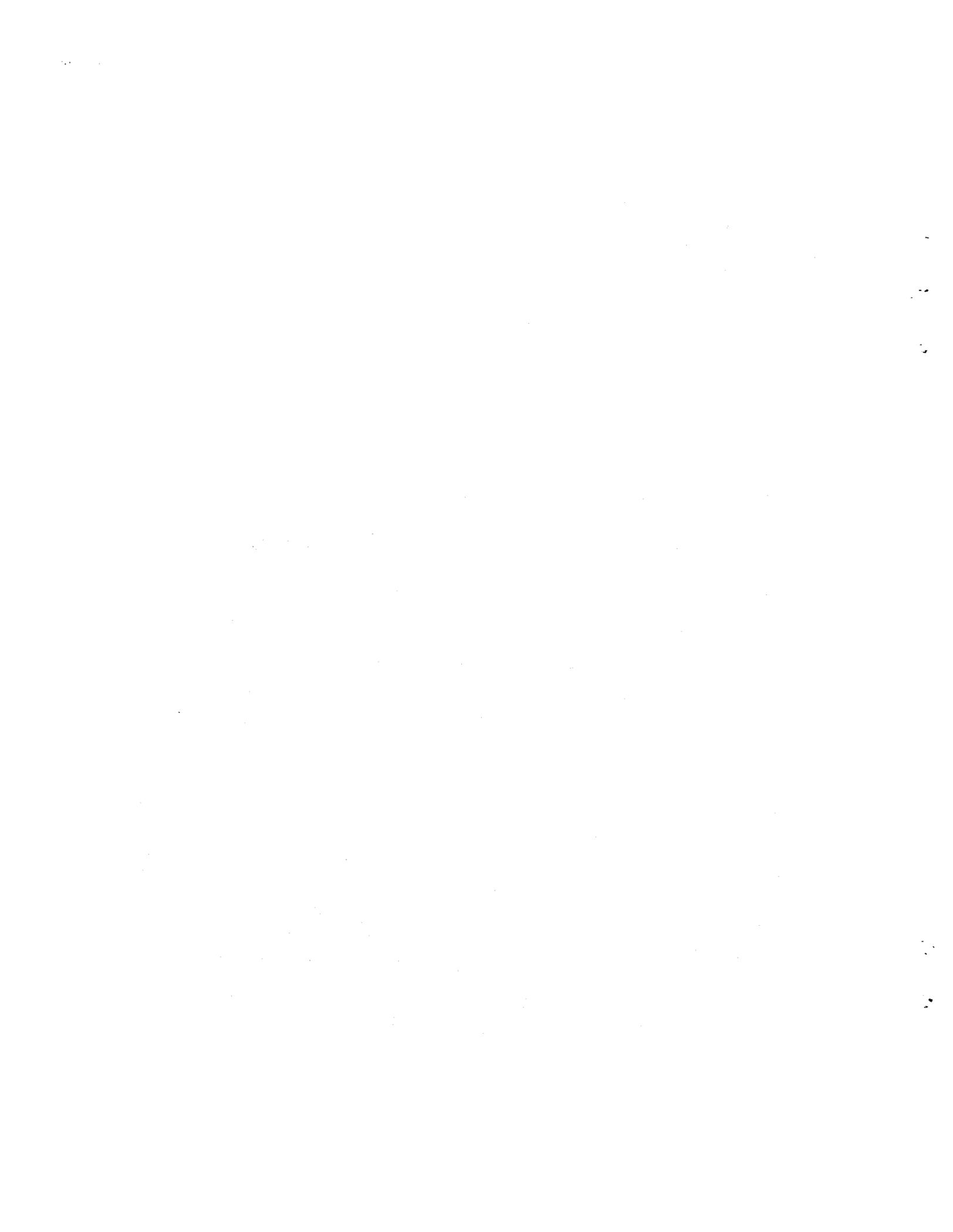
August 12, 1984



12:00 Midnight

August 12, 1984

FIGURE 2. Wind Fields Over the Hanford Site, August 11-13, 1985 (Continued)



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