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MEMORANDUM:

SUBJECT: Site characterization reports for Isoxaflutole PGW studies (447939-1 and -2)

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**Summary:** The site selection reports show very low  $K_{sat}$  layers at both selected sites. The low conductivity is far below current guidance for prospective groundwater study sites. Because of the low conductivity, EFED recommends that other sites be chosen for these studies.

As part of the conditional registration of the herbicide Isoxaflutole, Rhône-Poulenc was required to perform two prospective groundwater (PGW) studies on vulnerable sites. Rhône-Poulenc proposed two sites and undertook, at their own risk, site characterization simultaneously with monitoring well installation. Site characterization is normally performed prior to installation of monitoring wells and the start of a study. Because of the lack of site characterization, EFED did not approve Rhône-Poulenc's protocols for these studies. This review discusses two site characterization reports of those sites.

The two sites are located in Sioux county in northwestern Iowa and in Merrick county, in central Nebraska. They share many characteristics. Both have been growing corn at least since 1995 and have no previous use of Isoxaflutole. Both have slopes of < 1% and a low permeability layer at around 3.5 to 4 feet.

From the site selection information supplied by Rhône-Poulenc, there appeared to be no low

conductivity layers. The site characterization, however shows low conductivity layers in both soils at about three or four feet below ground. The  $K_{sat}$  was measured both in the field, using a Guelph permeameter, and in the lab using intact soil cores. Although the different methods report different values for  $K_{sat}$ , both values are below the current minimum value in the guidance of 0.5 cm/hr ( $1.4 \times 10^{-6}$  m/s). The lowest conductivity region in both soils is between 3.5 to 4 feet. Of 9 intact soil cores taken in that depth interval in Iowa, none showed any measurable  $K_{sat}$ . In Nebraska, three of the nine had measurable hydraulic conductivity, but the peak value was only 0.2 cm/hr and the average was 0.03 cm/hr. Field measurements of hydraulic conductivity also show very low values of 0.015 cm/hr in Nebraska at 2.5 ft and 0.014 cm/hr in Iowa at a depth of 4 ft.

Because of the restrictive layers in both of these sites, EFED cannot approve them for PGW studies.

The Iowa site also shows high organic matter contents averaging 4.5% in the top soil layer. PGW guidance recommends 2% or less making this site unacceptable for this reason as well.

It is possible that all tests have underestimated the hydraulic conductivity of the soils, if Rhône-Poulenc can demonstrate  $K_{sat}$  above 0.5 cm/hr throughout the profile, then this site may be acceptable.