Guide to the main concerns of the interested parties

Interested party	Conservationists	Farmers	Planners from the local water authority
Main concerns	Concerned with the preservation of sites of biological, geological, and historical importance, together with the maintenance of ecological balance and the quality of the environment in general.	Concerned with having the reservoir sited to result in the least possible loss of agricultural land to themselves.	Concerned primarily with providing a new, low-cost, pollution-free water supply for the conurbation. However, the reservoir would have additional value if it were to generate hydroelectric power or serve as a water-sport amenity.
Points to consider	A. SSSIs are designated Sites of Special Scientific Interest. B. New reservoirs may prove to be assets to wildlife eg. waterfowl, etc.		A. To generate hydroelectric power a head of water and a large volume are needed, and HEP stations are expensive to construct. B. The best type of reservoir for water sport will have a large surface area. C. The Water Authority will have to divert roads that will be flooded by the reservoir and will have to compensate people if their houses are drowned. This may be expensive - the average house price in 2020 is £315,000.

Table 1. Guide to the main concerns of conservationists, farmers, and planners from the local water authority.

Interested party	Hydrologists	Hydrogeologists	Engineering geologists
Main concerns	Concerned with water supply to the reservoir through tributary streams and surface runoff and with surface water losses.	Concerned with groundwater flow and underground water supply to and loss from the reservoir.	Concerned with the feasibility and cost of building a dam, preferring a simple, low-cost dam.
Points to consider	A. Runoff volume and runoff speed are greater on steep slopes with thin soils than on shallow slopes with thick soils. B. Evaporation rates will be affected by climate (e.g. cloud cover, humidity, temperature, windspeed) and water surface area.	A. Reservoirs which would leak due to the permeability of the underlying. rocks may be sealed by using a clay lining, but this is a very expensive operation, particularly if it is needed over a large area. B. Groundwater flow into the reservoir must be free of pollutants C. The porosities and permeabilities of the major rock types are shown in Table 4.	A. Choice of one of three of the main dam types shown in Figure 1. 1. A gravity dam. The weight holds the dam in position. The foundations must be excavated to sound bedrock. This type of dam needs a large volume of concrete or masonry and so needs a nearby suitable source of rock or sand and aggregate. 2. An arch dam. The curved shape holds the dam in position against walls and floor of gorge-like valleys. It needs solid bedrock: joints and fractures are potential weaknesses. The volume of sand and aggregate needed is small. 3. An embankment dam. Its weight and size hold the dam in position. The foundations must be firm. It has a very large volume and so a large quantity of low-quality fill from a nearby source is needed. B. Primary rock strengths and secondary weaknesses such as joints and faults must be considered.

Table 2. Guide to the main concerns of hydrologists, hydrogeologists, and engineering geologists.

Rock Type	Primary Porosity	Primary permeability	Potential for Secondary Porosity & Permeability
Granite	0%	Low	Fairly high
Thermally metamorphosed slate	0%	Low	Fairly high
Sandstone (after compaction & diagenesis)	10 - 30%	Low to high	Fairly high
Shale (after compaction & diagenesis)	15 - 20%	Low	Low
Limestone (after compaction & diagenesis)	0 - 10%	Usually, low	High
Coal (after compaction & diagenesis)	0%	Low	Low
Clay	50 - 80%	Low	Low

Table 3. Porosities and permeabilities of the major rock types