Purpose and Need
Preformed neoprene compression joint sealers have been widely used in North Dakota for many years. The first compression seals were used on I-94 near Sweet Briar Dam in 1964. There has been an increase in the usage of silicone sealants in concrete joints in the past few years. Preformed neoprene compression joint sealers have been effective at keeping out incompressible but tend to leak water. Preformed neoprene also are known to take a compression set, which is when the neoprene no longer presses tightly against the joint wall. Preformed sealers can often pop out of the joints at many locations causing an open joint and are unsightly. Silicone sealants seem to be performing satisfactorily. Research is needed to identify products that will provide long-term performance.

Objective
The objective of this study is to evaluate a polysulfide rubber joint sealant to determine if it provides effective long-term performance, hopefully ten years or more.

Location
The project is located in the city of Cavalier, North Dakota. The test section is partly in project NH-6-005(013)312 and project SS-6-018(033)224.

Scope
The contractor was using silicone to seal the joints on these projects and agreed to substitute the polysulfide sealant in the test section at no added cost. The installation procedure should be the same.

Summary
Both silicone and polysulfide joints had many leaks when tested with the I-Vac system. Thiokol 1P polysulfide sealants have been used in the private sector but never in a government project. The Cavalier project is one of the first to use this product.

No leaks were found in any of the sections right after construction in 1996. Approximately 155 lineal feet of joints were tested at no added cost. The installation procedure should be the same.

As of the August 2000 evaluation, both the silicone and polysulfide sealants have a 45% failure rating. It is questionable that the polysulfide sealant will meet our objective of providing long-term performance.

The cost of polysulfide at the time of construction was $32.00/gal. Compared to $26.00/ gal. For silicone. However, the contractor agreed to install polysulfide at the silicone bid price.

Recommendation
Based on physical properties and the results of the study, the polysulfide sealant did not perform any better than the silicone; The use of polysulfide rubber joint sealants is not recommended.

Present research has revealed that the PolySpec Corporation had acquired Morton’s line of formulated polysulfide products in 1998. According to a PolySpec representative they have stopped production of two unprofitable products in 1999, which are the 1P and 2P sealant types. Thus, the Thiokol 1P polysulfide product used on this project is no longer available.