



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 9 1987

OFFICE OF
WATER

MEMORANDUM

SUBJECT: Procedure for Interpreting Whether or Not a MIT Failure or Excess Injection Pressure is Reported as Significant Non-compliance - Underground Injection Control Program Guidance #58

FROM: Michael B. Cook, Director *Mike Cook*
Office of Drinking Water (WH-550)

TO: Water Management Division Directors
Drinking Water Branch Chiefs
State Program Directors
Regions I - X

BACKGROUND

On December 4, 1986, ODW issued the definition of Significant Non-compliance (SNC) to be used by EPA Regions and States. For two elements of that definition, MIT failures and injections over authorized pressure limits, the significance of a violation is a function of its potential for endangerment to a USDW using 12 listed criteria. To assure that these criteria would be applied consistently to reach comparable determinations, Regions and States were requested to submit examples of how in practice they would factor the 12 endangerment criteria into their decision-making processes.

We have received responses from six States, the UIPC and two Regions to this request for examples of how the process would work in the "real world." These responses were discussed by the UIPC's Regulatory Affairs Committee at its Denver meeting and an advisory resolution advocating the use of a flow chart process was passed by the UIPC Board and presented to EPA.

Approaches

Three basically different approaches were taken by those who responded to the December 4, 1986 memo: (1) assign a numeric value for each of the 12 criteria listed in the SNC definition with the total point score above some minimum score defined as SNC; (2) consider the 12 criteria in a logical manner with the aid of a flow chart to arrive at a SNC/non-SNC decision; and (3) a specific case scenario involving a fictitious well which illustrates how the criteria would be

applied. Approach one was rejected as being too complex for easy implementation by Regions and States and approach three was rejected because it would involve the development of too many illustrative well scenarios.

Discussion

To satisfy the objective of obtaining greater national consistency in the reporting of SNC violations, while not requiring the collection of large amounts of information, we have chosen an approach based on a logic sequence that looks at the presence or absence of USDWs, the level of USDW protection provided by casing and cement and the nature and extent of confining formations to determine whether or not a violation should be classified as SNC. Further, we have decided that this approach should be implemented based on the presumption that any MIT failure or pressure limit violation is a SNC unless application of the flow chart supported by appropriate data shows that the violation need not be classified as SNC. This is not to be interpreted as another data collection exercise. If readily available data do not support the decision to classify a violation as non-SNC, the presumption is that the violation is SNC.

Decision Flow Chart for Determining SNC/non-SNC Status

Attachments A and B are the Decision Flow Charts for determining the SNC/non-SNC status of any MIT or pressure limitation violation. Once either a MIT failure or pressure limit violation is discovered, determining whether the violation should be classified as SNC or non-SNC is accomplished by proceeding from left to right through the flow chart.

MIT Failure (Chart A)

Step 1. USDWs Present or Absent? If there are no USDWs present throughout the horizons penetrated by the injection well, or the USDWs present have been exempted under 40 C.F.R. § 144.7 (or similar State provision), the possibility of endangering a USDW does not exist and the violation is not a SNC. If USDWs are present, proceed to step 2.

- Step 2. Extent of MIT Failure? Determine the layers of protection that remain intact. If two or more, i.e., casing and cement are protecting all USDWs, then the potential for endangerment is low and the violation is not a SNC. If the adequacy of the cement cannot be positively established or if the outer casing is breached even if there is cement behind the casing, proceed to step 3 for further evaluation.
- Step 3. Location of Leak with Respect to USDW? Determine the location of any leaks and their proximity to USDWs. If the intervening layers are relatively thick, have low permeability, are not fractured, and are not penetrated by artificial conduits which could provide a pathway between the interval in which the leak has taken place and the USDWs and the well has sufficient cement between the leak and the USDW (evidenced by appropriate logs), then the injection presents a minimal risk of endangerment and the violation may be classified as non-SNC. If any of these factors are not satisfied, the violation must be reported as SNC.

Pressure Limit Violation (Chart B)

- Step 1. USDWs Present or Absent? If there are no USDWs present throughout the horizons penetrated by the injection well, or the USDWs present have been exempted under 40 C.F.R. § 144.7 (or similar State provision), the possibility of endangering a USDW does not exist and the violation is not a SNC. If USDWs are present, proceed to step 2.
- Step 2. Relationship between Injection and Formation Pressure? Determine whether or not 90% of the formation fracture pressure has been exceeded or for Class II well operating over the fracture pressure whether or not authorized injection pressure has been exceeded by more than five percent. If yes, proceed to step 3.

Step 3. Confining Layer Characteristics? Assess the characteristics of the confining layer(s) between the injection zone and lowermost USDW. If the intervening layers are relatively thick, have low permeability and are not fractured, and there are no other artificial penetrations through the confining layers including those affected by increased pressures within the area of review of the well, then the injection presents a minimal risk of endangerments and the violation may be classified as non-SNC. If any of these are not satisfied, the violation must be reported as SNC.

Implementation

Each State and Direct Implementation program director will incorporate the flow charts (Attachments A and B) into the program's standard procedures for determining compliance with UIC requirements. The director will certify that the flow chart procedure is being used as a condition of the annual UIC grant or as part of the annual Enforcement Agreement. Review of progress in implementation will be accomplished annually as part of the mid-year review process.

Conclusion

This guidance represents a final decision on how the SNC definition for the UIC program is to be implemented. We have received meaningful input from Regions and States and appreciate the coordination efforts of the UIPC's Regulatory Affairs Committee. Your input has been considered in developing this guidance. It is now time to put this procedure in place and to concentrate your efforts on identifying SNC violations, responding to the identified violations in a timely and appropriate manner and reporting your actions in a consistent manner on EPA Form 7520-4. Our program will for the first time be reporting to the Deputy Administrator on how we are managing the implementation of the UIC SNC definition in November 1987. Therefore, I request that you begin using the flow chart procedure immediately.

If you have any questions regarding this guidance, please contact me or Francoise Brasier, Chief, UIC Branch. Francoise may be reached at FTS 382-5530.

Attachments

cc: John Lyon, OECM
Mike Pague, UIPC
Tim Baker, OK
Bill Smith, CO

MIT FAILURE

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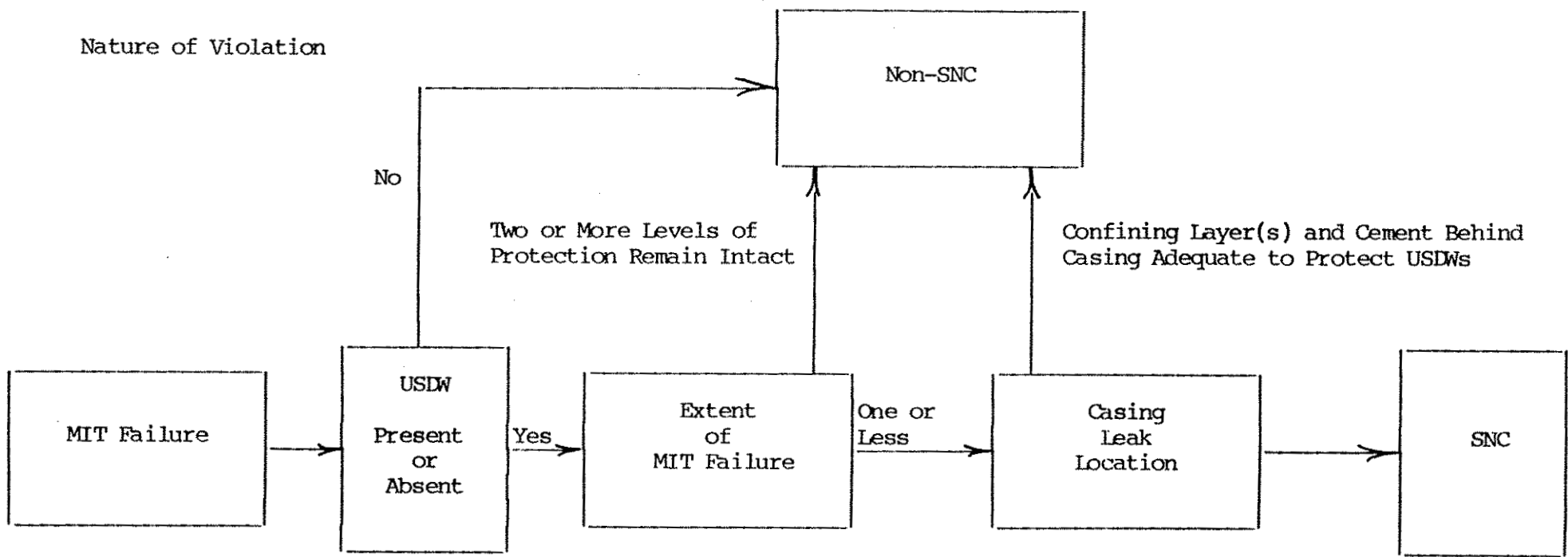
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Nature of Violation



Note: If data is lacking to support any of the decision points, the violation shall be assumed to be SNC.

PRESSURE LIMITATION EXCEEDED

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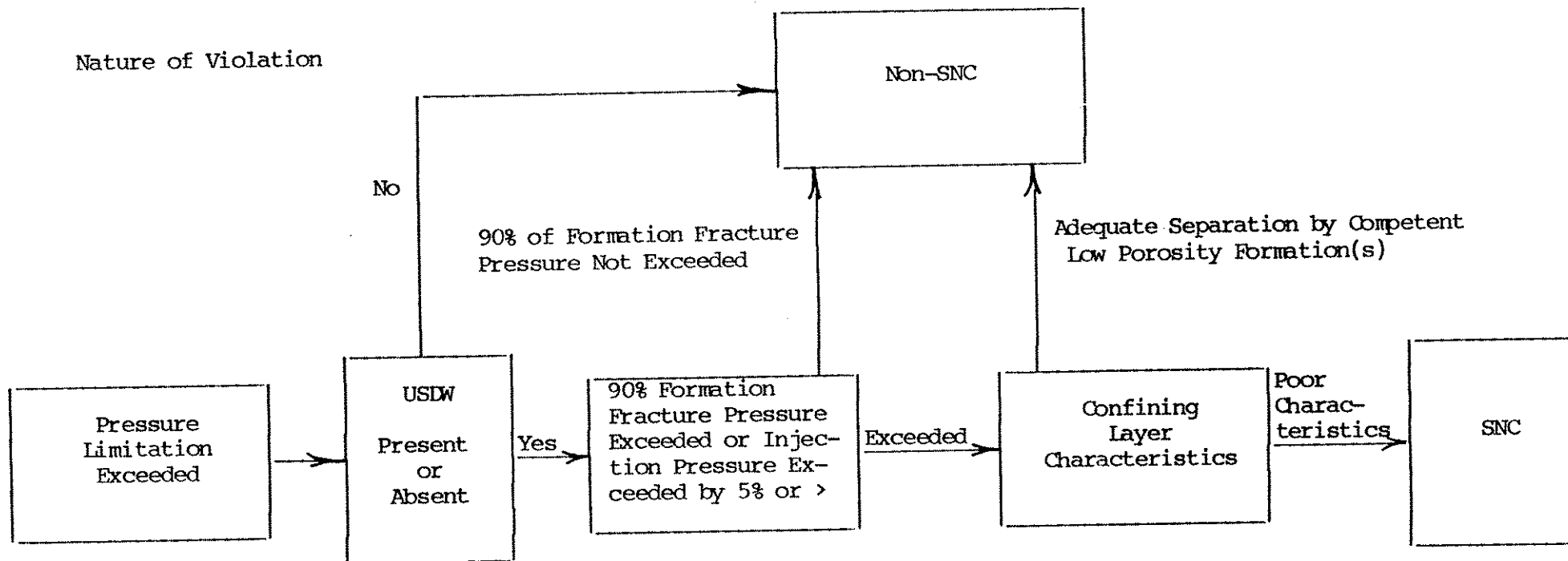
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Nature of Violation



Note: If data is lacking to support any of the decision points, the violation shall be assumed to be SNC.