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SUBJECT: **GROUND WATER SECTION GUIDANCE NO. 35**
Procedures to follow when excessive annular pressure is observed on a well.

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TO: All Section Staff
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The following procedure is intended as an aid to UIC field inspectors when they encounter excessive annular pressure on a well. Excessive annular pressure is defined as 100 psi or 10% of the tubing pressure, whichever is less.

Usually, annular pressure is a direct indication of a loss of mechanical integrity. In some instances, recurring annular pressure may be caused by fluctuations in the temperature of the injected fluid. These temperature fluctuations may cause the annular pressure to increase when a hot fluid is being injected and decrease as the temperature of the injected fluid cools. The presence of temperature-induced pressure on the annulus does not indicate a malfunction in the casing/tubing/packer system and is not considered a loss of mechanical integrity. Wells exhibiting recurring temperature-induced annular pressure may be allowed to continue injecting if a temperature monitoring program is approved and followed.

This guidance was written to help determine the cause of annular pressure. When the procedures in this guidance are followed, any major mechanical integrity problems (a breech in the casing/tubing/packer system) will become apparent quickly. A quick determination will allow the operator to begin follow-up procedures immediately to prevent contamination to USDWs.

Use Section Guidance No. 35 to determine if the well has experienced a loss of mechanical integrity. If you find that there is a loss of mechanical integrity, use *Headquarters Guidance No. 76. - Follow-up to loss of Mechanical Integrity for Class II Wells* to bring the well back into compliance. The use of Section Guidance No. 35 is not to be confused with, nor does it supersede any provision of Headquarters Guidance No. 76. Instead, the two guidance documents are meant to work together to identify and to remedy any potential mechanical integrity failure.

A flowchart for Section Guidance No. 35 is included for quick reference in the field.

PROCEDURES TO FOLLOW WHEN EXCESSIVE ANNULAR PRESSURE IS OBSERVED

During field inspections, the following procedures should be followed when excessive annular pressure is observed. Excessive annular pressure is defined as 100 psi or 10% of the tubing pressure, whichever is less.

Note Conditions at the Well	Note tubing and annular pressure readings, and the operating status of the well (injecting, shut-in, etc.) on the UIC inspection form.	
See If Annulus Pressure Will Bleed-off	Attempt to bleed the pressure from the annulus by having the operator open the annulus (for a maximum of sixty seconds). It is the operator's responsibility to collect and dispose of any fluids bled from the annulus.	
Did the Annular Pressure Bleed to 0 Psi Within Sixty Seconds?	YES Have the operator close the annulus. On your inspection form note the volume of fluid (or gas) bled from the annulus during the sixty seconds, and the tubing and annulus pressures.	NO Have the operator close the annulus. On your inspection form note the volume of fluid (or gas) bled from the annulus during the sixty seconds, and the tubing and annulus pressures. Have the operator shut the well in for 2 hours, and if possible, bleed pressure from the injection tubing. Record the tubing and annulus pressure after two hours. Bleed off the annulus for 60 seconds. Record the tubing and annulus pressures after bleed-off, and estimate the volume bled off. INFORM THE OPERATOR THAT THE WELL HAS AN APPARENT MECHANICAL INTEGRITY FAILURE and provide the operator with the guidance that discusses OPERATOR RESPONSIBILITIES FOLLOWING MECHANICAL INTEGRITY FAILURES. **END PROCEDURE**.

See If Pressure Returns Within 15 Minutes	Continue to monitor the well for annulus pressure return for at least 15 minutes after the annulus valve is closed.	
Does Pressure Return to the Annulus after 15 Minutes?	YES On your inspection form, note the annulus and tubing pressures recorded after 15 minutes.	NO Require the operator to monitor and report to EPA with the annulus and tubing pressures for at least 14 days to see if pressure returns to the annulus.

	Have the operator shut the well in for 2 hours, and if possible, bleed pressure from the injection tubing. Record the tubing and annulus pressure after two hours. Bleed off the annulus for 60 seconds. Record the tubing and annulus pressures after bleed-off, and estimate the volume bled off. INFORM THE OPERATOR THAT THE WELL HAS AN APPARENT MECHANICAL INTEGRITY FAILURE and provide the operator with the guidance that discusses OPERATOR RESPONSIBILITIES FOLLOWING MECHANICAL INTEGRITY FAILURES. **END PROCEDURE**.	Instruct the operator to contact EPA as soon as any pressure returns to the annulus.
DOES PRESSURE RETURN TO THE ANNULUS WITHIN 14 DAYS?	YES EPA Technical Expert will design a proper Mechanical Integrity test. Compliance officer will require the operator to conduct the test within 14 days.	NO The well is considered to have mechanical integrity. **END PROCEDURE**.

Does the Well Pass the MIT?	YES Require the operator to monitor and report to EPA with the annulus and tubing pressures for at least 14 days to see if pressure returns to the annulus. Instruct the operator to contact EPA as soon as any pressure returns to the annulus.	NO INFORM THE OPERATOR THAT THE WELL HAS AN APPARENT MECHANICAL INTEGRITY FAILURE and provide the operator with the guidance that discusses OPERATOR RESPONSIBILITIES FOLLOWING MECHANICAL INTEGRITY FAILURES.**END PROCEDURE**.
Does Pressure Return to the Annulus Within 14 Days?	YES EPA Technical Expert will design a proper Monitoring Program to determine the cause of recurrent annular pressure. Compliance officer will require the operator to begin the Monitoring program within 14 days. Conduct unannounced inspections at the	NO The well is considered to have mechanical integrity. **END PROCEDURE**.

	well during the Monitoring Program.	
Is the Annulus Pressure Caused by Temperature?	YES EPA Technical Expert will design a proper Temperature Monitoring Program that allows injection to continue while tracking relationship between temperature and recurrent annulus pressure. Compliance officer will require the operator to cease injection immediately if the operator fails to follow the Temperature Monitoring Program. Compliance officer will require the operator to cease injection immediately if recurrent annular pressures cannot be explained by the results of the Temperature Monitoring Program. Compliance officer will require annual Mechanical Integrity Tests using the standard pressure method.	NO INFORM THE OPERATOR THAT THE WELL HAS AN APPARENT MECHANICAL INTEGRITY FAILURE and provide the operator with the guidance that discusses OPERATOR RESPONSIBILITIES FOLLOWING MECHANICAL INTEGRITY FAILURES. **END PROCEDURE**.

14-DAY PRESSURE MONITORING

Please use this form to report data for a 14-day period after pressure is bled from the tubing-casing annulus. Please telephone EPA in Denver as soon as possible when/if pressure returns to the annulus. This data will be used to determine the cause(s) of recurrent annular pressure.

NOTE: DO NOT BLEED PRESSURE FROM ANNULUS DURING THE 14-DAY MONITORING PERIOD.

	DATE	TIME	ANNULUS PRESSURE (psi)	TUBING PRESSURE (psi)	WELL INJECTING (YES/NO)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

WELL NAME:_____

OPERATOR:_____

SIGNATURE:_____ DATE:_____