MJW TECHNICAL SERVICES

Rev 1 10/18/15

Instrument Field Response Check Log

1. **Instrument Information**[1]
   Ratemeter: Make/Model: Ludlum 2241-12 Serial No. 206098 Cal. Due Date: 9/1/16
   Detector 1: Make/Model: Ludlum 44-10 Serial No. PR112642
   Bicron MicroRem Meter: Serial No. _____ Cal. Due Date: _____

2. **Check Source Information:**
   Source 1 Isotope: Th-232 Serial No.: 111 Activity: <0.1 units: µCi Assay Date: 12/30/10
   Response Acceptance Range (+/-20%): uRem/hr +20% _____ uRem/hr -20% _____ net cpm + 20% 53798 net cpm -20% 35866

   Source 2 Isotope: Cs-137 Serial No.: 119E23-12 Activity: 0.02 units: µCi Assay Date: NA
   Response Acceptance Range (+/-20%): uRem/hr +20% _____ uRem/hr -20% _____ net cpm + 20% 13273 net cpm -20% 8849

3. **Technician/Worker Performing Checks:**
   Name: J. Edwards Title: RCT Date: 10/15/15 Time: 1005

4. **Site or Location:** Site/Job: Area 3.2 Location Description: Farm
   GPS Coordinates (when required): X-Coord: NA Y-Coord: NA

	Instrument Field Response[2]				Use Acceptance Criteria					Remarks
Meter	Bkg Cnt Time	Bkg Counts (cpm) or uRem/hr)	Source Cnt Time	Source Response (gross cpm or uRem/hr)	+/- 20% source gross cpm or uRem/hr (Y/N)	Inst. Calib. current (Y/N)	Battery Check (Y/N)	Time Of check	Ambient Temp. (°F)	Initials and Comments (add'l Info: inst. Condition, etc.)
Ratemeter	1 min	9431 cpm	1 min	44832 cpm	Y	Y	Y	1045	55.7	Th-232 JE
Ratemeter			1 min	10972 cpm	Y	Y	Y	1058	56.3	Cs-137 JE
Ratemeter										
Ratemeter										
Bicron	NA		NA							
Bicron	NA		NA							
Bicron	NA		NA							
Bicron	NA		NA							

1. Instrument designated check source is listed on calibration sticker. Record check source response (net cpm) prior to field deployment for all check sources being used.
2. Source and Background count rate should be determined from the average of three static counts at the same location. Repeat counts should be within 20%. If count rate diverges significantly, perform additional counts to evaluate instrument stability

MJW TECHNICAL SERVICES

Instrument Field Response Check Log

1. **Instrument Information**[1]
   Ratemeter: Make/Model: BICRON MICRO REM Serial No. A274U Cal. Due Date: 8/4/16
   Detector 1: Make/Model: INTERNAL Serial No. N/A
   Detector 2: Make/Model: _____ Serial No. _____
2. **Check Source Information:**
   Source 1 Isotope: Th232 Serial No.: 116 Activity: <0.1 units: uCi Assay Date: 12/30/10
   Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____

   Source 2 Isotope: _____ Serial No.: _____ Activity: _____ units: _____ Assay Date: _____
   Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____
3. **Technician/Worker Performing Checks:**
   Name: STEVE KINSMAN Title: _____ Date: 10/16/15 Time: 0957
4. **Site or Location:** Site/Job: 3.2 Location Description: FARM
   GPS Coordinates (when required): X-Coord: N 42° 28' 50.3" Y-Coord: W 078° 40' 27.2"

Instrument Field Response[2]					Use Acceptance Criteria					Remarks
Det. No. (1 / 2)	BKg Cnt Time	Bkg ~~(avg of 3) (cpm)~~ uR/HR	Source Cnt Time	Source Response ~~(cpm - bkg) Net cpm~~	+/- 20% of source Net cpm (Y/N)	Inst. Calib. current (Y/N)	Battery Check (Y/N)	Time Of check	Ambient Temp. (F)	Initials and Comments (add'l info: temperature, inst. Condition, etc.)
		5		17 uR/HR		Y	Y	0957	48.2	SK

1. Instrument designated check source is listed on calibration sticker. Record check source response (net cpm) prior to field deployment for all check sources being used.
2. Source and Background count rate should be determined from the **average of three static counts** at the same location. Repeat counts should be within 20%. If count rate diverges significantly, perform additional counts to evaluate instrument stability

MJW TECHNICAL SERVICES

Instrument Field Response Check Log

1. **Instrument Information**[1]
   Ratemeter: Make/Model: LUDLUM 2241-2 Serial No. 262737 Cal. Due Date: 9/2/10
   Detector 1: Make/Model: LUDLUM 44-10 Serial No. PR-111121
   Detector 2: Make/Model: _____ Serial No. _____
2. **Check Source Information**:
   Source 1 Isotope: Th 232 Serial No.: 116 Activity: <0.1 units: uci Assay Date: 12/30/10
   Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____

   Source 2 Isotope: Cs 137 Serial No.: 87E13-48 Activity: .02 units: uci Assay Date: 1/20/10
   Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____
3. **Technician/Worker Performing Checks**:
   Name: STEVE KINSMAN Title: _____ Date: 10/16/15 Time: 1000
4. **Site or Location**: Site/Job: 3.2 Location Description: FARM
   GPS Coordinates (when required): X-Coord:_____ Y-Coord:_____

SOURCE Instrument Field Response[2]					Use Acceptance Criteria					Remarks
~~Det:~~ No. (1 / 2)	BKg Cnt Time	Bkg (avg of 3) (cpm)	Source Cnt Time	Source Response (cpm - bkg) Net cpm	+/- 20% of source Net cpm (Y/N)	Inst. Calib. current (Y/N)	Battery Check (Y/N)	Time Of check	Ambient Temp. (F)	Initials and Comments (add'l Info: temperature, Inst. Condition, etc.)
TH232	1 MIN	7820	1 MIN.	19105		Y	Y	1000	48.2	SK
Cs137	1 MIN	7820	1 MIN.	11146		Y	Y	1005	48.2	SK

1. Instrument designated check source is listed on calibration sticker. Record check source response (net cpm) prior to field deployment for all check sources being used.
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MJW TECHNICAL SERVICES

Instrument Field Response Check Log

1. **Instrument Information**[1]
   Ratemeter: Make/Model: BICRON MICROREM Serial No. A2224u Cal. Due Date: 8/4/16
   Detector 1: Make/Model: INTERNAL Serial No. N/A
   Detector 2: Make/Model: _____ Serial No. _____
2. **Check Source Information:**
   Source 1 Isotope: Th232 Serial No.: 116 Activity: <0.1 units: uCi Assay Date: 12/30/10
   Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____

   Source 2 Isotope: _____ Serial No.: _____ Activity: _____ units: _____ Assay Date: _____
   Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____
3. **Technician/Worker Performing Checks:**
   Name: STEVE KINSMAN Title: _____ Date: 10/16/15 Time: 1400
4. **Site or Location**: Site/Job: 3.2 Location Description: FARM
   GPS Coordinates (when required): X-Coord:_____ Y-Coord:_____

Instrument Field Response[2]					Use Acceptance Criteria					Remarks
Det. No. (1 / 2)	BKg Cnt Time	Bkg ~~(avg of 3)~~ ~~(cpm)~~ uR/Hr	Source Cnt Time	Source Response ~~(cpm - bkg)~~ ~~Net cpm~~	+/- 20% of source Net cpm (Y/N)	Inst. Calib. current (Y/N)	Battery Check (Y/N)	Time Of check	Ambient Temp. (F)	Initials and Comments (add'l Info: temperature, inst. Condition, etc.)
		6		18 uR/Hr		Y	Y	1400	53.6	

1. Instrument designated check source is listed on calibration sticker. Record check source response (net cpm) prior to field deployment for all check sources being used.
2. Source and Background count rate should be determined from the **average of three static counts** at the same location. Repeat counts should be within 20%. If count rate diverges significantly, perform additional counts to evaluate instrument stability

MJW TECHNICAL SERVICES

Instrument Field Response Check Log

1. **Instrument Information**[1]
   - Ratemeter: Make/Model: LUDLUM 2241-2 Serial No. 262737 Cal. Due Date: 9/2/16
   - Detector 1: Make/Model: LUDLUM 44-10 Serial No. PR111127
   - Detector 2: Make/Model: _____ Serial No. _____
2. **Check Source Information:**
   - Source 1 Isotope: Th232 Serial No.: 116 Activity: <0.1 units: uCi Assay Date: 12/30/10
     Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____
   - Source 2 Isotope: Cs137 Serial No.: 87E13-48 Activity: .02 units: uCi Assay Date: 1/20/10
     Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____
3. **Technician/Worker Performing Checks:**
   Name: STEVE KINSMAN Title: _____ Date: 10/16/15 Time: 1410
4. **Site or Location**: Site/Job: 3.2 Location Description: _____
   GPS Coordinates (when required): X-Coord: _____ Y-Coord: _____

SOURCE	Instrument Field Response[2] GROSS CTS				Use Acceptance Criteria					Remarks
~~Det.~~ No. (1 / 2)	BKg Cnt Time	Bkg (avg of 3) (cpm)	Source Cnt Time	Source Response (~~cpm - bkg~~) ~~Net cpm~~	+/- 20% of source Net cpm (Y/N)	Inst. Calib. current (Y/N)	Battery Check (Y/N)	Time Of check	Ambient Temp. (F)	Initials and Comments (add'l info: temperature, inst. Condition, etc.)
Th232	1 MIN	7621	1 MIN	19835		Y	Y	1410	53.6	SK
Cs137	1 MIN	7621	1 MIN	11161		Y	Y	1415	53.6	SK

1. Instrument designated check source is listed on calibration sticker. Record check source response (net cpm) prior to field deployment for all check sources being used.
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MJW TECHNICAL SERVICES

Instrument Field Response Check Log

1. **Instrument Information**[1]
   - Ratemeter: Make/Model: LUDLUM 2241-2 Serial No. 262737 Cal. Due Date: 9/2/16
   - Detector 1: Make/Model: LUDLUM 44-10 Serial No. PR111127
   - Detector 2: Make/Model: _____ Serial No. _____
2. **Check Source Information:**
   - Source 1 Isotope: Th 232 Serial No.: 116 Activity: 40.1 units: uci Assay Date: 12/30/10
     Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____
   - Source 2 Isotope: Cs 137 Serial No.: 87E13-48 Activity: .02 units: uci Assay Date: 1/20/10
     Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____
3. **Technician/Worker Performing Checks:**
   Name: STEVE KINSMAN Title: _____ Date: 10/16/15 Time: 1515
4. **Site or Location**: Site/Job:_____ Location Description:_____
   GPS Coordinates (when required): X-Coord:_____ Y-Coord:_____

SOURCE Instrument Field Response[2] GROSS CTS					Use Acceptance Criteria					Remarks
~~Det.~~ No. (1 / 2)	BKg Cnt Time	Bkg (avg of 3) (cpm)	Source Cnt Time	Source Response (~~cpm - bkg~~) ~~Net cpm~~	+/- 20% of source Net cpm (Y/N)	Inst. Calib. current (Y/N)	Battery Check (Y/N)	Time Of check	Ambient Temp. (F)	Initials and Comments (add'l Info: temperature, inst. Condition, etc.)
Th232		7496		19694		Y	Y	1515	53.6	
Cs137		7496		10845		Y	Y	1520	53.6	

1. Instrument designated check source is listed on calibration sticker. Record check source response (net cpm) prior to field deployment for all check sources being used.
2. Source and Background count rate should be determined from the **average of three static counts** at the same location. Repeat counts should be within 20%. If count rate diverges significantly, perform additional counts to evaluate instrument stability

MJW TECHNICAL SERVICES

Instrument Field Response Check Log

1. **Instrument Information**[1]
   Ratemeter: Make/Model: BICRON MICROREM Serial No. A2244 Cal. Due Date: 8/4/16
   Detector 1: Make/Model: INTERNAL Serial No. _____
   Detector 2: Make/Model: _____ Serial No. _____
2. **Check Source Information:**
   Source 1 Isotope: Th232 Serial No.: 116 Activity: 40.1 units: uci Assay Date: 12/30/10
   Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____

   Source 2 Isotope: _____ Serial No.: _____ Activity: _____ units: _____ Assay Date: _____
   Instrument Response Acceptance Range (source cpm - bkg +/-20%): net cpm + 20%_____ net cpm -20% _____
3. **Technician/Worker Performing Checks:**
   Name: STEVE KINSMAN Title: _____ Date: 10/16/15 Time: 1515
4. **Site or Location**: Site/Job: 3-2 Location Description: FARM
   GPS Coordinates (when required): X-Coord: _____ Y-Coord: _____

Instrument Field Response[2]					Use Acceptance Criteria					Remarks
Det. No. (1 / 2)	BKg Cnt Time	Bkg ~~(avg of 3)~~ (~~cpm~~) uR/Hr	Source Cnt Time	Source Response (~~cpm - bkg~~) uR/Hr ~~Net cpm~~	+/- 20% of source Net cpm (Y/N)	Inst. Calib. current (Y/N)	Battery Check (Y/N)	Time Of check	Ambient Temp. (F)	Initials and Comments (add'l Info: temperature, inst. Condition, etc.)
		7		17		Y	Y	1515	56.3	

1. Instrument designated check source is listed on calibration sticker. Record check source response (net cpm) prior to field deployment for all check sources being used.
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Instrument Field Response Check Log

1. **Instrument Information**[1]
   Ratemeter: Make/Model: LUDLUM 2241-2 Serial No. 262737 Cal. Due Date: 9/2/16
   Detector 1: Make/Model: LUDLUM 44-10 Serial No. PR111127
   Bicron MicroRem Meter: Serial No. A224u Cal. Due Date: 8/4/16

2. **Check Source Information:**
   Source 1 Isotope: Th232 Serial No.: 116 Activity: 40.1 units: uci Assay Date: 12/30/10
   Response Acceptance Range (+/-20%): uRem/hr +20% _____ uRem/hr -20% _____ net cpm + 20% _____ net cpm -20% _____

   Source 2 Isotope: Cs137 Serial No.: 87E13-48 Activity: .02 units: uci Assay Date: 1/20/10
   Response Acceptance Range (+/-20%): uRem/hr +20% _____ uRem/hr -20% _____ net cpm + 20% _____ net cpm -20% _____

3. **Technician/Worker Performing Checks:**
   Name: STEVE KINSMAN Title: _____ Date: 10/19/15 Time: 0935

4. **Site or Location:** Site/Job: 3.2 Location Description: FARM
   GPS Coordinates (when required): X-Coord: 78.674117° Y-Coord: 42.48070°

	Instrument Field Response[2]				Use Acceptance Criteria					Remarks
Meter	Bkg Cnt Time	Bkg Counts (cpm) or uRem/hr)	Source Cnt Time	Source Response (gross cpm or uRem/hr)	+/- 20% source gross cpm or uRem/hr (Y/N)	Inst. Calib. current (Y/N)	Battery Check (Y/N)	Time Of check	Ambient Temp. (°F)	Initials and Comments (add'l info: inst. Condition, etc.)
Ratemeter	1MIN	7893	1MIN	19674 cpm		Y	Y	0935	33.4	Th232
Ratemeter	1MIN	7893	1MIN	11228 cpm		Y	Y	0940	33.4	Cs137
Ratemeter	1MIN	7552	1MIN	19351 cpm		Y	Y	1325	54.5	Th232
Ratemeter	1MIN	7552	1MIN	10692 cpm		Y	Y	1325	54.5	Cs137
Bicron	NA	5 uR/HR	NA	18 uR/Hr		Y	Y	0930	33.4	
Bicron	NA	6 uR/HR	NA	17 uR/Hr.		Y	Y	1320	54.5	
Bicron	NA	6 uR/HR	NA	16 uR/Hr.		Y	Y		58.6	
Bicron	NA		NA							

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Instrument Field Response Check Log

1. **Instrument Information**[1]

   Ratemeter: Make/Model: _____ Serial No. _____ Cal. Due Date: _____

   Detector 1: Make/Model: _____ Serial No. _____

   Bicron MicroRem Meter: Serial No. _____ Cal. Due Date: _____

2. **Check Source Information:**

   Source 1 Isotope: _____ Serial No.: _____ Activity: _____ units: _____ Assay Date: _____

   Response Acceptance Range (+/-20%): uRem/hr +20% _____ uRem/hr -20% _____ net cpm + 20% _____ net cpm -20% _____

   Source 2 Isotope: _____ Serial No.: _____ Activity: _____ units: _____ Assay Date: _____

   Response Acceptance Range (+/-20%): uRem/hr +20% _____ uRem/hr -20% _____ net cpm + 20% _____ net cpm -20% _____

3. **Technician/Worker Performing Checks:**

   Name: _____ Title: _____ Date: 10/19/15 Time: _____

4. **Site or Location:** Site/Job: _____ Location Description: _____

   GPS Coordinates (when required): X-Coord: _____ Y-Coord: _____

	Instrument Field Response[2]				Use Acceptance Criteria					Remarks
Meter	Bkg Cnt Time	Bkg Counts (cpm) or uRem/hr)	Source Cnt Time	Source Response (gross cpm or uRem/hr)	+/- 20% source gross cpm or uRem/hr (Y/N)	Inst. Calib. current (Y/N)	Battery Check (Y/N)	Time Of check	Ambient Temp. (°F)	Initials and Comments (add'l info: inst. Condition, etc.)
Ratemeter	1MIN	8854 cpm	1MIN	19517 cpm		Y	Y	1540	58.6	Th232
Ratemeter	1MIN	8854 cpm	1MIN	12422 cpm		Y	Y	1545	58.6	Cs137
Ratemeter										
Ratemeter										
Bicron	NA		NA							
Bicron	NA		NA							
Bicron	NA		NA							
Bicron	NA		NA							

1. Instrument designated check source is listed on calibration sticker. Record check source response (net cpm) prior to field deployment for all check sources being used.
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