CONTINUING EDUCATION UNITS
Landscape Irrigation Auditor

CEU SUBMISSION PACKAGE
June, 2011

1. Read and follow the **Procedures to Submit Field Audits**. Audit field work and calculations must be conducted and completed independently by the candidate with no outside assistance of any type.

2. Complete the **CEU Pre-Approval Application Form.** No fee required for application.

3. Conduct field audit. Record all audit data on IA forms – 8 worksheets for rotor area and 8 worksheets for spray area. Only data submitted on IA forms will be used to grade the audit. Do not submit additional materials or photographs. Fill out the candidate and site info at the top of every audit worksheet. Do not write your name on the worksheets, only your Candidate ID.

    - For the rotor area audit, complete a designated watering days irrigation schedule. Assume watering restrictions are in place that will limit irrigation to every third day.
    - For the spray area audit, complete a soil moisture bucket irrigation schedule.

4. Complete the **Audit Submission Form with payment** to the IA office at the address below.

5. **FIRST TIME SUBMISSIONS:** Mail original **Submission Form** and **16 Audit Worksheets** to the Irrigation Association. Make a copy for your records. You will receive email verification when your audit is received at the IA office. If you do not receive verification of receipt within two weeks of sending the audit contact the IA office.

6. **RESUBMISSIONS:** Mail original **Resubmission Form** with payment information and corrected **Audit Worksheets** to the Irrigation Association. Make a copy for your records. You will receive email verification when your audit is received at the IA office. If you do not receive verification of receipt within two weeks of sending the audit contact the IA office.

7. Certified professionals who have submitted passing audits will receive four CEUs. CEUs will be automatically entered on your record.

8. Send to:

    Cory Harlow
    Irrigation Association
    6540 Arlington Blvd
    Falls Church, VA 22042-6638

CONTINUING EDUCATION UNITS
LANDSCAPE IRRIGATION AUDIT – SUBMISSION FORM

AUDIT SUBMISSION FORM

CERTIFIED PROFESSIONAL'S INFORMATION

□ Dr. □ Mr. □ Mrs. □ Miss □ Ms.

Last Name First M.I.

Business name (if applicable):

Address

Address

City State/Province Zip/postal code

Phone

E-mail

Candidates are required to conduct field audits and complete all calculations independently with no assistance. Audits conducted as part of a class do not meet this requirement.

Rotor Audit Site Date

Spray Audit Site Date

I conducted the field work on the site(s) and date(s) identified above and completed all calculations independently without outside assistance.

Auditor Signature

Date

To submit a field audit for CEUs after eligibility approval has been granted :

1) Complete audit on IA CEU audit worksheets
2) Sign and make sure all pages are included
3) Make a copy for your records
4) Mail the original audit to:
   Cory Harlow
   Irrigation Association
   6540 Arlington Blvd.
   Falls Church, VA 22042
5) You will be notified via e-mail when the audit is received at the IA.
6) Four CEUs will be entered by IA staff after successful completion of audit.

Please note that it may take up to twelve weeks to process your CEU audit.

The Irrigation Association reserves the right to revoke any certification if it was obtained under conditions that did not meet the posted requirements, if any portion of the Code of Ethics is not upheld or if renewal/CEU procedures are not adhered to.

CEU Audit Submission Fees (Required)

IA member submit	$ 75
Nonmember submit	$125

Payment

$_____ US Total enclosed or authorized
□Check here for receipt

Check: #_____
Remit in US $ drawn on a US bank, payable to the Irrigation Association.

Charge: □VISA □MasterCard □American Express

Card Number

_____ / _____
Expiration (month/year)

Name on Card

X_____
Signature

CONTINUING EDUCATION UNITS - AUDIT

June 2011

PROCEDURES TO CONDUCT AND SUBMIT FIELD AUDITS FOR CEUS

To submit an irrigation audit for CEUs you must:

1) Be pre-approved for the program.
2) Be a current CLIA who completed their certification prior to June 1, 2011.
3) Successful completion of independent field audit: Landscape - one rotor (minimum 4 heads) and one spray (minimum 8 heads) area on new CEU specific audit forms (posted June, 2011).
4) Submit payment for audit submission.
5) Once successfully completed, CEUs will be automatically added to your record. You must pass the audit to earn CEUs.

Candidates are required to conduct audits and complete calculations independently with no assistance. Audits conducted as part of a class do not meet this requirement.

WHEN YOU ARE READY TO CONDUCT THE FIELD AUDIT

1) Check the IA web site for the correct version of the Audit Work Sheets. Print a hard copy of the forms. Audits must be submitted on these worksheets.
2) Conduct field audit. For rotor area complete the designated days schedule assuming watering restrictions allowing watering every third day. For the spray zone, complete the soil moisture bucket schedule. Fill out all information completely including date(s), time(s), pressure and flow data, etc.
3) Complete the remaining forms making sure to show all values and calculations. Pay careful attention to the DU_{LQ}, precipitation rate and run time calculations. These must be calculated to within the rounding margin of error in order for the audit to be approved.

WHEN YOU ARE READY TO SUBMIT YOUR FIELD AUDIT

1) Sign and make sure all pages are included
2) Make a copy for your records
3) Mail the original audit to:
   Cory Harlow
   Irrigation Association
   6540 Arlington Blvd.
   Falls Church, VA 22042
4) You will be notified when the audit is received at the IA
5) Results will be mailed to the address shown on the verification form.

RESULTS AND CEU UPDATE MAY TAKE UP TO TWEVLE WEEKS TO COMPLETE.

The Irrigation Association reserves the right to revoke any certification if it was obtained under conditions that did not meet the posted requirements, if any portion of the Code of Ethics is not upheld or if renewal/CEU procedures are not adhered to.

REJECTING AUDITS

Audits may be rejected if you receive assistance or if you observe someone while they conduct their audit on the same site where you will be conducting your field work.

If there is reason to believe that the audit was not conducted independently or if any information was copied or falsified, the certified professional will be notified in writing and given an opportunity to respond. After investigating, the certification board will make a decision about the consequences which may include a partial or full ban of the certified professional's involvement in the IA Certification Program. The certified professional will be notified in writing of the decision.

CEU

Site Conditions Review – Rotor Worksheet # 1

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Controller ID/Name										
Controller station(s) #										
Area/location										
Irrigated area		ft^2		ft^2		ft^2		ft^2		ft^2
Plant material (all that apply)										
Plant condition (choose one)										
Microclimate (choose one)										
Soil category (choose one)										
Root depth		in.		in.		in.		in.		in.
Slope (choose one)										
Compaction (Y/N)										
Runtime until runoff		min		min		min		min		min
Standing water (Y/N)										
Hydrozone separation (Y/N)										

Abbreviation Key

Plant Materials
- CS= Cool season turf
- WS= Warm season turf
- T= Trees
- S= Shrubs
- N= Native plants
- GC= Ground cover

Soil Category
- C= Coarse
- MC= Moderately coarse
- M= Medium
- MF= Moderately fine
- F= Fine

Slope
- F= Flat
- SL= Slight
- Mod= Moderate
- Stp= Steep

Plant Condition
- LM= Low maintenance, stressed
- TRD= Traditional, some stress, but generally good condition
- HQ= High quality, majority are vigorously growing

Microclimate
- FS= Full sun all day
- PS= Part shade, less than 6 hours of sun per day
- SH= Full shade all day
- EX= Extreme conditions (parking lots, south-facing glass or wall)

CEU

Sprinkler System Review – Rotor Worksheet # 2

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Abbreviation Key: S = Spray, fixed nozzle R = Rotor, including MSMT nozzles I = Impact X = Needs correction ✓ = Correction

Controller ID/Name										
Controller Station #										
Sprinkler type (choose one)										
Station flow		gpm		gpm		gpm		gpm		gpm
High pressure		psi		psi		psi		psi		psi
Low pressure		psi		psi		psi		psi		psi
Action Required (Place "X" for action needed, ✓ when completed)	X	✓	X	✓	X	✓	X	✓	X	✓
Broken pipes										
Missing/broken heads										
Missing nozzle										
psi adjustment needed										
Clogged nozzle										
Heads not turning										
Arc misalignment										
Low head drainage										
Leaking seals/fittings										
Spray deflected/blocked										
Sunken head										
Tilted heads										
Mismatched heads										
Spray/rotor separation										
Spacing uneven										
Valve malfunction										

Observations on Maintenance Frequency

CEU

Water Source and System Data – Rotor Worksheet # 3

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Water Source Data

Water Source (check one)							
	Potable	Reclaimed		Well		Pond	
	Other (explain)						
Backflow Device (check one)							
	None	Reduced Pressure Assembly		Double Check Valve		Pressure Vacuum Breaker	Atmospheric Vacuum Breaker
Size		in.					
Other (explain)							
Pump or Pump Station (check one)							
	No	Yes					
	Maximum flow		gpm				
	Pressure		psi				
Meter (check one)							
	No	Yes					
	Size		in.				
	Units (check one)	gallons		cubic feet			
	Static pressure		psi (during scheduled irrigation window)				
	Dynamic pressure		psi (during scheduled irrigation window)				

POC Flow Data (use catalog data if non-metered sources exist)

Meter Number	Station Number	gallons (cf)	Beginning Readings	Ending Readings	Total	Beginning Time	Ending Time	Elapsed Time

CEU

Controller Features – Rotor Worksheet # 4

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Manufacturer		**Central Control** (check one)			
			Yes		No
Model Number		**Weather Station** (check one)			
			Yes		No
Stations Being Used		**Smart Controller** (check one)			
			Yes		No

Station Run Time Range (min)			
Minimum		Maximum	

Number of Programs	**Start Times/Program**

Calendar Days (check one)							
	7 days		14 days		Other (explain)		

Irrigation Interval (check options available)							
	Daily		Even/Odd		Custom (explain)		

Rain delay (maximum days)	**Skip Day Period** (maximum days)

Percent Adjust Options (check applicable)									
	Global		By program		By station		By month		Seasonal

Sensors Installed (make & model)	
Rain	
Freeze	
Wind	
Temperature	
Flow	
Soil moisture	
Tipping bucket	

Notes

CEU

Controller Settings – Rotor Worksheet # 5

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Current Controller Settings

Program	Start Times				Days On															
	1	2	3	4		S		M		T		W		T		F		S		
A						S		M		T		W		T		F		S		
B						S		M		T		W		T		F		S		
C						S		M		T		W		T		F		S		
D						S		M		T		W		T		F		S		

Program	Station	Minutes		Program	Station	Minutes		Program	Station	Minutes

Smart Controller Settings

Station	Program	PR	DU	Plant Factor	Soil Type	Slope	Soil Moisture

CEU

Test Area Map – Rotor Worksheet # 6

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Test Area/Station								
Test Run Time		min	Wind		mph	Pressure		psi
Meter Start			Meter Stop			Total		

**Indicate north and ALL audit area and sprinkler dimensions
O = SPRINKLER – Record the location of each sprinkler and sprinkler spacing.
X = CATCH DEVICE – Record the location of each catch device and catch amount.

CEU

Catch Can Test – Rotor Worksheet # 7

Project Name		Date		
Address		Candidate ID #		
City, State		Page		of

Test Area/Station					
Catch Device Area (A_{CD})		$in.^2$	Test Run Time (t_R)		min

Catch Device Volumes: ***All values and calculations must be completed on this page; auditing software is not acceptable for use in determining these values.***

#1		#13		#25		#37		#49		#61		#73	
#2		#14		#26		#38		#50		#62		#74	
#3		#15		#27		#39		#51		#63		#75	
#4		#16		#28		#40		#52		#64		#76	
#5		#17		#29		#41		#53		#65		#77	
#6		#18		#30		#42		#54		#66		#78	
#7		#19		#31		#43		#55		#67		#79	
#8		#20		#32		#44		#56		#68		#80	
#9		#21		#33		#45		#57		#69		#81	
#10		#22		#34		#46		#58		#70		#82	
#11		#23		#35		#47		#59		#71		#83	
#12		#24		#36		#48		#60		#72		#84	
Sub-total		**Sub-total**		**Sub-total**		**Sub-total**		**Sub-total**		**Sub-total**		**Sub-total**	

Total Catch Volume		**Total Low Quarter**	
Average Volume		**Average Low Quarter**	

Calculate Distribution Uniformity (show work)	**Calculate Net Precipitation Rate** (show work)
$DU_{LQ} = \frac{\text{avg catch in low quarter}}{\text{avg catch volume}}$ $= \frac{\quad\quad mL}{\quad\quad mL}$ = _____	$PR_{net} = \frac{3.66 \times V_{avg}}{T_r \times A_{CD}}$ $= \frac{3.66 \times (\quad\quad mL)}{(\quad\quad min) \times (\quad\quad in.^2)}$ = _____

CEU

Designated Watering Days Irrigation Schedule – Rotor Worksheet # 8

Project Name		Date	
Address		Candidate ID #	
City, State		Station	

Watering Days or Interval (see instructions)					
Plant Water Requirement		**Value**		**Units**	**Source**
A.	Hydrozone type				field observation
B.	Reference period			days	
C.	Reference ET [ET_O]			in.	weather data
D.	Landscape coefficient [K_L]				$K_T \times K_d \times K_{mc}$
	1) Turf or plant factor [K_T or K_P]				charts & tables
	2) Vegetation density factor [K_d]				charts & tables
	3) Microclimate factor [K_{mc}]				charts & tables
E.	Landscape ET [ET_L]			in.	C × D
F.	Average daily ET_L			in.	E ÷ B
Sprinkler Performance		**Value**		**Units**	**Source**
G.	Precipitation rate [PR]			in./h	audit or calculation
H.	Distribution uniformity [DU_{LQ}]			decimal	audit or estimate
I.	Scheduling multiplier [SM]				table or equation
Scheduling Parameters		**Value**		**Units**	**Source**
J.	Irrigation interval			days	watering days (see instructions)
K.	Water to apply			in.	J × F
L.	Lower boundary			min	(K ÷ G) × 60
M.	Upper boundary			min	(L × I)
N.	**Selected Run Time**			min	management decision
O.	Determine cycle starts (CHOOSE METHOD A OR B)				
	a. Observed time to runoff			min	field observation
OR	b. Site conditions			cycles	based on site conditions
	1) Soil category		Coarse = 1, Medium= 2, Fine = 3		
	2) Slope		Flat = 0, Slight = 1, Moderate = 2, Steep = 3		
	3) Compaction		No = 0, Yes = 1		
	4) Sprinkler type		Rotor = 0, Spray = 1		

Scheduling Summary	**Value**	**Units**	**Source**
Water to be applied		in.	Line K
Interval		days	Line J
Cycle starts per day			(Line N ÷ O-a) (round up) or O-b
Minutes per cycle		min	Line N ÷ Cycle starts

CEU

Site Conditions Review – Spray Worksheet # 1

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Controller ID/Name										
Controller station(s) #										
Area/location										
Irrigated area		ft^2		ft^2		ft^2		ft^2		ft^2
Plant material (all that apply)										
Plant condition (choose one)										
Microclimate (choose one)										
Soil category (choose one)										
Root depth		in.		in.		in.		in.		in.
Slope (choose one)										
Compaction (Y/N)										
Runtime until runoff		min		min		min		min		min
Standing water (Y/N)										
Hydrozone separation (Y/N)										

Abbreviation Key

Plant Materials
- CS= Cool season turf
- WS= Warm season turf
- T= Trees
- S= Shrubs
- N= Native plants
- GC= Ground cover

Soil Category
- C= Coarse
- MC= Moderately coarse
- M= Medium
- MF= Moderately fine
- F= Fine

Slope
- F= Flat
- SL= Slight
- Mod= Moderate
- Stp= Steep

Plant Condition
- LM= Low maintenance, stressed
- TRD= Traditional, some stress, but generally good condition
- HQ= High quality, majority are vigorously growing

Microclimate
- FS= Full sun all day
- PS= Part shade, less than 6 hours of sun per day
- SH= Full shade all day
- EX= Extreme conditions (parking lots, south-facing glass or wall)

CEU

Sprinkler System Review – Spray Worksheet # 2

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Abbreviation Key: S = Spray, fixed nozzle R = Rotor, including MSMT nozzles I = Impact **X** = Needs correction ✓ = Correction

Controller ID/Name										
Controller Station #										
Sprinkler type (choose one)										
Station flow		gpm		gpm		gpm		gpm		gpm
High pressure		psi		psi		psi		psi		psi
Low pressure		psi		psi		psi		psi		psi
Action Required (Place "X" for action needed, ✓ when completed)	X	✓	X	✓	X	✓	X	✓	X	✓
Broken pipes										
Missing/broken heads										
Missing nozzle										
psi adjustment needed										
Clogged nozzle										
Heads not turning										
Arc misalignment										
Low head drainage										
Leaking seals/fittings										
Spray deflected/blocked										
Sunken head										
Tilted heads										
Mismatched heads										
Spray/rotor separation										
Spacing uneven										
Valve malfunction										

Observations on Maintenance Frequency

CEU

Water Source and System Data – Spray Worksheet # 3

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Water Source Data

Water Source (check one)							
☐	Potable	☐ Reclaimed		☐ Well		☐ Pond	
☐	Other (explain)						
Backflow Device (check one)							
☐	None	☐ Reduced Pressure Assembly		☐ Double Check Valve		☐ Pressure Vacuum Breaker	☐ Atmospheric Vacuum Breaker
Size		in.					
Other (explain)							
Pump or Pump Station (check one)							
☐	No	☐ Yes					
	Maximum flow		gpm				
	Pressure		psi				
Meter (check one)							
☐	No	☐ Yes					
	Size		in.				
	Units (check one)	☐ gallons		☐ cubic feet			
	Static pressure		psi (during scheduled irrigation window)				
	Dynamic pressure		psi (during scheduled irrigation window)				

POC Flow Data (use catalog data if non-metered sources exist)

Meter Number	Station Number	gallons (cf)	Beginning Readings	Ending Readings	Total	Beginning Time	Ending Time	Elapsed Time

CEU

Controller Features – Spray Worksheet # 4

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Manufacturer		**Central Control** (check one)			
			Yes		No
Model Number		**Weather Station** (check one)			
			Yes		No
Stations Being Used		**Smart Controller** (check one)			
			Yes		No

Station Run Time Range (min)			
Minimum		Maximum	

Number of Programs	**Start Times/Program**

Calendar Days (check one)							
	7 days		14 days		Other (explain)		

Irrigation Interval (check options available)							
	Daily		Even/Odd		Custom (explain)		

Rain delay (maximum days)	**Skip Day Period** (maximum days)

Percent Adjust Options (check applicable)									
	Global		By program		By station		By month		Seasonal

Sensors Installed (make & model)	
Rain	
Freeze	
Wind	
Temperature	
Flow	
Soil moisture	
Tipping bucket	

Notes

CEU

Controller Settings Spray – Worksheet # 5

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Current Controller Settings

Program	Start Times				Days On															
	1	2	3	4		S		M		T		W		T		F		S		
A						S		M		T		W		T		F		S		
B						S		M		T		W		T		F		S		
C						S		M		T		W		T		F		S		
D						S		M		T		W		T		F		S		

Program	Station	Minutes		Program	Station	Minutes		Program	Station	Minutes

Smart Controller Settings

Station	Program	PR	DU	Plant Factor	Soil Type	Slope	Soil Moisture

CEU

Test Area Map – Spray Worksheet # 6

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Test Area/Station								
Test Run Time		min	Wind		mph	Pressure		psi
Meter Start			Meter Stop			Total		

**Indicate north and ALL audit area and sprinkler dimensions
O = SPRINKLER – Record the location of each sprinkler and sprinkler spacing.
X = CATCH DEVICE – Record the location of each catch device and catch amount.

CEU

Catch Can Test - Spray Worksheet # 7

Project Name		Date			
Address		Candidate ID #			
City, State		Page		of	

Test Area/Station					
Catch Device Area (A_{CD})		$in.^2$	Test Run Time (t_R)		min

Catch Device Volumes: ***All values and calculations must be completed on this page; auditing software is not acceptable for use in determining these values.***

#1		#13		#25		#37		#49		#61		#73	
#2		#14		#26		#38		#50		#62		#74	
#3		#15		#27		#39		#51		#63		#75	
#4		#16		#28		#40		#52		#64		#76	
#5		#17		#29		#41		#53		#65		#77	
#6		#18		#30		#42		#54		#66		#78	
#7		#19		#31		#43		#55		#67		#79	
#8		#20		#32		#44		#56		#68		#80	
#9		#21		#33		#45		#57		#69		#81	
#10		#22		#34		#46		#58		#70		#82	
#11		#23		#35		#47		#59		#71		#83	
#12		#24		#36		#48		#60		#72		#84	
Sub-total		**Sub-total**		**Sub-total**		**Sub-total**		**Sub-total**		**Sub-total**		**Sub-total**	

Total Catch Volume		**Total Low Quarter**	
Average Volume		**Average Low Quarter**	

Calculate Distribution Uniformity (show work)	**Calculate Net Precipitation Rate** (show work)
$DU_{LQ} = \frac{\text{avg catch in low quarter}}{\text{avg catch volume}}$ $= \frac{\quad\quad mL}{\quad\quad mL}$ = _____	$PR_{net} = \frac{3.66 \times V_{avg}}{T_r \times A_{CD}}$ $= \frac{3.66 \times (\quad\quad mL)}{(\quad\quad min) \times (\quad\quad in.^2)}$ = _____

CEU - Soil Moisture Bucket Irrigation Schedule – Spray Worksheet # 8

Project Name		Date	
Address		Candidate ID #	
City, State		Station	

Plant Water Requirement		**Value**		**Units**	**Source**
A.	Hydrozone type				field observation
B.	Reference period			days	
C.	Reference ET [ET_O]			in.	weather data
D.	Landscape coefficient [K_L]				$K_T \times K_d \times K_{mc}$
	1) Turf or plant factor [K_T or K_P]				charts & tables
	2) Vegetation density factor [K_d]				charts & tables
	3) Microclimate factor [K_{mc}]				charts & tables
E.	Landscape ET [ET_L]			in.	C × D
F.	Average daily ET_L			in.	E ÷ B
Sprinkler Performance		**Value**		**Units**	**Source**
G.	Precipitation rate [PR]			in./h	audit or calculation
H.	Distribution uniformity [DU_{LQ}]			decimal	audit or estimate
I.	Scheduling multiplier [SM]				table or equation
Soil Moisture "Bucket"		**Value**		**Units**	**Source**
J.	Soil category				field observation
K.	Available water [AW]			in./in.	charts & tables
L.	Root zone depth			in.	field measurement
M.	Plant available water [PAW]			in.	K × L
N.	Management allowable depletion [MAD]			decimal	50% for landscapes
O.	Allowable depletion [AD]			in.	M × N
Scheduling Parameters		**Value**		**Units**	**Source**
P.	Irrigation interval			days	O ÷ F (round down)
Q.	Water to apply			in.	F × P
R.	Lower boundary			min	(Q ÷ G) × 60
S.	Upper boundary			min	(R × I)
T.	**Selected Run Time**			min	management decision
U.	Determine cycle starts (CHOOSE METHOD A OR B)				
	a. Observed time to runoff			min	field observation
OR	b. Site conditions			cycles	based on site conditions
	1) Soil category		Coarse = 1, Medium = 2, Fine = 3		
	2) Slope		Flat = 0, Slight = 1, Moderate = 2, Steep = 3		
	3) Compaction		No = 0, Yes = 1		
	4) Sprinkler type		Rotor = 0, Spray = 1		

Scheduling Summary	**Value**	**Units**	**Source**
Water to be applied		in.	Line Q
Interval		days	Line P
Cycle starts per day			(Line T ÷ U-a) (round up) or U-b
Minutes per cycle		min	Line T ÷ Cycle starts