

Technical Memorandum 3-2
Aquatic Macroinvertebrates
Downstream of Englebright Reservoir

Attachment 3-2C

QA/QC Report

Yuba River Development Project
FERC Project No. 2246

April 2013

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The following quality assurance quality control (QA/QC) report was created by the California Department of Fish and Game Aquatic Bioassessment Laboratory located in Chico, California. The lab completed the QA/QC analysis of both Study 3.1 *Aquatic Macroinvertebrates Upstream of Englebright Reservoir* and Study 3.2 *Aquatic Macroinvertebrates Downstream of Englebright Reservoir* in the same report. Only the results pertaining to that of sample no. EC-2204 (Site5) are relative to this technical memorandum.

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Comparative Taxonomic Listing of all Submitted Samples

Samples submitted by HDR Consulting, Inc. for Project: Yuba River 2012

Report prepared by Brady Richards, CDFG ABL-Chico, 1/10/2013

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
Dan Pickard	EC-2204			0	x	0	
		1	Phaenopsectra	1	L	1	Phaenopsectra
		2	Polypedilum	5	L	5	Polypedilum
		3	Paratanytarsus	77	L	2	Micropsectra/Tanytarsus
		3	Paratanytarsus	77	L	68	Paratanytarsus
		3	Paratanytarsus	77	L	5	Rheotanytarsus
		3	Paratanytarsus	77	L	1	Micropsectra
		4	Rheotanytarsus	20	L	19	Rheotanytarsus
		5	Tanytarsus	144	L	44	Tanytarsus
		5	Tanytarsus	144	L	58	Micropsectra
		5	Tanytarsus	144	L	23	Paratanytarsus
		5	Tanytarsus	144	L	11	Tanytarsini
		5	Tanytarsus	144	L	1	Orthocladius complex
		6	Paratanytarsus	3	P	3	Paratanytarsus
		7	Rheotanytarsus	3	P	3	Rheotanytarsus
		8	Tanytarsus	6	P	3	Tanytarsus
		8	Tanytarsus	6	P	3	Micropsectra
		9	Potthastia longimana group	1	L	1	Potthastia longimana group
		10	Orthocladius complex	49	L	1	Parakiefferiella
		10	Orthocladius complex	49	L	1	Eukiefferiella
		10	Orthocladius complex	49	L	1	Limnophyes
		10	Orthocladius complex	49	L	5	Cricotopus
		10	Orthocladius complex	49	L	29	Orthocladius complex
		10	Orthocladius complex	49	L	11	Orthoclaadiinae

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
Dan Pickard	EC-2204	11	Cricotopus/Orthocladius	3	L	3	Cricotopus
		12	Eukiefferiella	34	L	34	Eukiefferiella
		13	Tvetenia	5	L	5	Tvetenia bavarica group
		14	Cricotopus bicinctus group	57	L	16	Orthocladiinae
		14	Cricotopus bicinctus group	57	L	22	Orthocladius complex
		14	Cricotopus bicinctus group	57	L	3	Cricotopus bicinctus group
		14	Cricotopus bicinctus group	57	L	1	Parakiefferiella
		14	Cricotopus bicinctus group	57	L	14	Cricotopus
		15	Cricotopus	9	P	1	Micropsectra
		15	Cricotopus	9	P	7	Cricotopus
		16	Corynoneura	1	L	1	Corynoneura
		17	Thienemanniella	2	L	2	Thienemanniella
		18	Thienemannimyia group	19	L	19	Thienemannimyia group
		19	Thienemannimyia group	3	P	3	Thienemannimyia group
		20	Neoplata	5	L	5	Neoplata
		21	Antocha	1	L	1	Antocha monticola
		22	Centroptilum	2	L	2	Centroptilum
		23	Baetis tricaudatus	66	L	1	Rheotanytarsus
		23	Baetis tricaudatus	66	L	63	Baetis tricaudatus
		23	Baetis tricaudatus	66	L	4	Acentrella
		24	Ephemerella	2	L	2	Ephemerella
		25	Heptageniidae	1	L	1	Heptageniidae
		26	Paraleptophlebia	8	L	8	Paraleptophlebia
		27	Claassenia sabulosa	1	L	1	Claassenia sabulosa
		28	Skwala	8	L	8	Skwala
		29	Glossosoma	1	L	1	Glossosoma
		30	Hydropsyche	2	L	2	Hydropsyche

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
Dan Pickard	EC-2204	31	Hydroptila	2	L	2	Hydroptila
		32	Lepidostoma	1	L	1	Lepidostoma
		33	Lebertia	1	X	1	Lebertia
		34	Sperchon	2	X	1	Sperchon
		34	Sperchon	2	X	1	Lebertia
		35	Oligochaeta	17	X	17	Oligochaeta
		36	Lymnaea	1	X	1	Lymnaea
		37	Physa	1	X	1	Physa
		38	Gyraulus	1	X	1	Gyraulus
		39	Turbellaria	2	X	2	Turbellaria
		40	Microtendipes rydalensis group	1	L	1	Microtendipes rydalensis group

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
HDR	Oregon Cr abv						
		1	Cleptelmis addenda	19	A	1	Microcylloepus similis
		1	Cleptelmis addenda	19	A	5	Optioservus
		1	Cleptelmis addenda	19	A	13	Zaitzevia parvula
		2	Cleptelmis addenda	112	L	53	Optioservus
		2	Cleptelmis addenda	112	L	20	Ordobrevia nubifera
		2	Cleptelmis addenda	112	L	42	Zaitzevia
		3	Psephenus falli	3	L	3	Eubrianax edwardsii
		4	Stenocolus scutellaris	2	L	2	Stenocolus scutellaris
		5	Apedilum	28	L	5	Microtendipes pedellus group
		6	Polypedilum	22	L	4	Polypedilum
		7	Orthoclaadiinae	17	L	1	Eukiefferiella
		7	Orthoclaadiinae	17	L	2	Stenochironomus
		8	Brillia	11	L	2	Parametriocnemus
		9	Chaetocladius	6	L	1	Parametriocnemus
		10	Cricotopus/Orthoclaadius	11	L	2	Parametriocnemus
		11	Parametriocnemus	6	L	1	Polypedilum
		12	Paraphaenoclaadius	6	L	1	Parametriocnemus
		13	Ablabesmyia	6	L	1	Ablabesmyia
		14	Clinocera	2	L	2	Clinocera
		15	Simulium	24	L	24	Simulium
		16	Tabanus	1	L	1	Tabanus
		17	Homoptera	6	L	6	Rhagovelia
		18	Sialis	13	L	13	Sialis
		19	Ophiogomphus	5	L	5	Octogomphus specularis
		20	Lepidoptera	1	L	1	Stenochironomus
		21	Baetis tricaudatus	46		0	vial not submitted
		22	Ephemera	33	L	11	Paraleptophlebia

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
HDR	Oregon Cr abv						
		22	Ephemerella	33	L	7	Tricorythodes
		22	Ephemerella	33	L	15	Serratella
		23	Epeorus iron	21	L	6	Epeorus
		23	Epeorus iron	21	L	16	Ecdyonurus
		24	Plecoptera	6	L	6	Chloroperlidae
		25	Chloroperlidae	4	L	3	Calineuria californica
		25	Chloroperlidae	4	L	1	Nemouridae
		26	Nemouridae	1	L	1	Nemouridae
		27	Calineuria	7	L	7	Calineuria californica
		28	Hesperoperla	55	L	52	Calineuria californica
		28	Hesperoperla	55	L	2	Hesperoperla pacifica
		29	Hydropsyche	7	L	7	Hydropsyche
		30	Ecclisomyia	9	L	9	Lepidostoma
		31	Wormaldia	3	L	3	Wormaldia
		32	Rhyacophila	10	L	10	Rhyacophila
		33	Acari	4	X	3	Torrenticola
		33	Acari	4	X	1	Mideopsis
		34	Bythinia	4	X	3	Juga
		35	Oligochaeta	17	X	18	Oligochaeta
		36	Glossosoma	3	L	3	Glossosoma
		37	Chironomidae	112	L	88	Chironomidae
		37	Chironomidae	112	L	1	Heteroplectron californicum

Listing of Enumeration Discrepancies

Samples submitted by ECORP Consulting, Inc. for Project: Yuba River 2012

Report prepared by Brady Richards, CDFG ABL-Chico, 1/10/2013

	Sample #	Vial #	Original ID	# Counted Original	QC	Difference (Original - QC)
Major Counting Discrepancies						
	Oregon Cr	5	Apedilum	28	5	23
		6	Polypedilum	22	4	18
		7	Orthoclaadiinae	17	3	14
		8	Brillia	11	2	9
		9	Chaetocladius	6	1	5
		10	Cricotopus/Ortho cladius	11	2	9
		11	Parametriocnemus	6	1	5
		12	Paraphaenocladius	6	1	5
		13	Ablabesmyia	6	1	5
		21	Baetis tricaudatus	46	0	46
	37	Chironomidae	112	89	23	
Minor Counting Discrepancies						
	EC-2204	3	Paratanytarsus	77	76	1
		4	Rheotanytarsus	20	19	1
		5	Tanytarsus	144	137	7
		10	Orthocladius complex	49	48	1
		14	Cricotopus bicinctus group	57	56	1
		15	Cricotopus	9	8	1
		23	Baetis tricaudatus	66	68	-2

Sample #	Vial #	Original ID	# Counted		Difference (Original - QC)
			Original	QC	
Oregon Cr	2	Cleptelmis addenda	112	115	-3
	23	Epeorus iron	21	22	-1
	28	Hesperoperla	55	54	1
	34	Bythinia	4	3	1
	35	Oligochaeta	17	18	-1

Listing of Taxonomic Discrepancies

Samples submitted by ECORP Consulting, Inc. for Project: Yuba River 2012

Report prepared by Brady Richards, CDFG ABL-Chico, 1/10/2013

Sample #	Vial #	Original ID	Final ID QC Final ID	Taxonomic level of dispute	# Organisms	Comments
EC-2204						
		Disputed ID				
	3	Paratanytarsus	Micropsectra	Genus	1	
	3	Paratanytarsus	Rheotanytarsus	Genus	5	
	5	Tanytarsus	Micropsectra	Genus	58	
	5	Tanytarsus	Paratanytarsus	Genus	23	
	5	Tanytarsus	Orthocladius complex		Subfamily	1 This disputed ID also
represents						a difference in taxonomic precision.
	8	Tanytarsus	Micropsectra	Genus	3	
	10	Orthocladius complex	Eukiefferiella	Genus complex	1	This disputed ID also represents a difference in taxonomic precision.
	10	Orthocladius complex	Limnophyes	Genus complex	1	This disputed ID also represents a difference in taxonomic precision.
	10	Orthocladius complex	Parakiefferiella	Genus complex	1	This disputed ID also represents a difference in taxonomic precision.
	10	Orthocladius complex	Cricotopus	Genus complex	5	This disputed ID also represents a difference in taxonomic precision.
	14	Cricotopus	Orthocladius complex		Genus complex	22 This disputed ID also
represents		bicinctus group				a difference in taxonomic precision.
	14	Cricotopus bicinctus group	Parakiefferiella	Genus	1	This disputed ID also represents a difference in taxonomic precision.
	15	Cricotopus	Micropsectra	Subfamily	1	
	23	Baetis tricaudatus	Acentrella	Genus	4	This disputed ID also represents a difference in taxonomic precision.

Sample #	Vial #	Final ID		Taxonomic level of dispute	# Organisms	Comments
		Original ID	QC Final ID			
Original ID not in Master Taxa List	34	Sperchon	Lebertia	Family	1	
	11	Cricotopus/Orthocla dius	Cricotopus dius		3	
QC ID not in Master Taxa List	3	Paratanytarsus	Micropsectra/Tanytar		2	
	21	Antocha	Antocha monticola		1	
Probable sorting error	23	Baetis tricaudatus	Rheotanytarsus	Order	1	This disputed ID also represents a difference in taxonomic precision.
Original ID less precise	13	Tvetenia	Tvetenia bavarica		5	
Original ID more precise	5	Tanytarsus	Tanytarsini		11	
	10	Orthocladius complex	Orthocladiinae		11	
	14	Cricotopus bicinctus group	Cricotopus		14	
	14	Cricotopus bicinctus group	Orthocladiinae		16	

Sample #	Vial #	Final ID		Taxonomic level of dispute	# Organisms	Comments
		Original ID	QC Final ID			
Oregon Cr Disputed ID	1	Cleptelmis addenda	Microcylloepus	Genus	1	
	1	Cleptelmis addenda	Optioservus	Genus	5	This disputed ID also represents a difference in taxonomic precision.
	1	Cleptelmis addenda	Zaitzevia parvula	Genus	13	
	2	Cleptelmis addenda	Optioservus	Genus	53	This disputed ID also represents a difference in taxonomic precision.
	2	Cleptelmis addenda	Ordobrevia nubifera	Genus	20	
	2	Cleptelmis addenda	Zaitzevia	Genus	42	This disputed ID also represents a difference in taxonomic precision.
	3	Psephenus falli	Eubrianax edwardsii	Genus	3	
	5	Apedilum	Microtendipes	Genus	5	This disputed ID also represents a difference in taxonomic precision.
	7	Orthocladiinae	Stenochironomus	Subfamily	2	This disputed ID also represents a difference in taxonomic precision.
	8	Brillia	Parametriocnemus	Genus	2	
	9	Chaetocladius	Parametriocnemus	Tribe	1	
	11	Parametriocnemus	Polypedilum	Subfamily	1	
	12	Paraphaenocladius	Parametriocnemus	Genus	1	
	19	Ophiogomphus	Octogomphus	Genus	5	This disputed ID also represents a difference in taxonomic precision.
	20	Lepidoptera	Stenochironomus	Order	1	This disputed ID also represents a difference in taxonomic precision.
	22	Ephemerella	Tricorythodes	Family	7	
	22	Ephemerella	Paraleptophlebia	Family	11	
	22	Ephemerella	Serratella	Genus	15	
	25	Chloroperlidae	Calineuria californica	Family	3	This disputed ID also represents a difference in taxonomic precision.

Sample #	Vial #	Final ID		Taxonomic level of dispute	# Organisms	Comments
		Original ID	QC Final ID			
	25	Chloroperlidae	Nemouridae	Family	1	
	28	Hesperoperla	Calineuria californica	Genus	52	This disputed ID also represents a difference in taxonomic precision.
	30	Ecclisomyia	Lepidostoma	Family	9	
	33	Acari	Torrenticola	Subclass	3	This disputed ID also represents a difference in taxonomic precision.
	33	Acari	Mideopsis	Subclass	1	This disputed ID also represents a difference in taxonomic precision.
Original ID not in Master Taxa List	10	Cricotopus/Orthocla dius	Parametriocnemus		2	
	17	Homoptera	Rhagovelia		6	
	23	Epeorus iron	Epeorus		6	
	23	Epeorus iron	Ecdyonurus		16	
	24	Pleocoptera	Chloroperlidae		6	
	34	Bythinia	Juga		3	
Probable sorting error	37	Chironomidae	Heteroplectron	Order	1	This disputed ID also represents a difference in taxonomic precision.
Vial not submitted	21	Baetis tricaudatus	vial not submitted		0	
Original ID less precise	7	Orthocladiinae	Eukiefferiella		1	
	27	Calineuria	Calineuria californica		7	
	28	Hesperoperla	Hesperoperla pacifica		2	

Summary of Taxonomic and Enumeration Discrepancies

Samples submitted by ECORP Consulting, Inc. for Project: Yuba River 2012

Report prepared by Brady Richards, CDFG ABL-Chico, 1/10/2013

Sample	Total Taxa	Taxonomic Discrepancies				Counting Discrepancies					
		Disputed ID		Taxonomic Precision		Major		Minor			
				Relative to QC							
		<i>f</i> *	<i>n</i> **	More precise <i>f</i>	Less Precise <i>n</i>	<i>f</i>	<i>d</i> ***	<i>f</i>	<i>d</i>		
EC-2204	42	15	128	4	52	1	5	-	-	7	14
Oregon Cr abv	40	24	257	-	-	3	10	11	162	5	7

* = the frequency of occurrence of the discrepancy, in number of samples

** = the number of organisms affected (by QC Lab counts) *n*

*** = the sum total of (absolute value of) differences in counts *d*

f

QC Report - Disputed IDs only

Samples submitted by ECORP Consulting, Inc. for Project: Yuba River 2012
 Report prepared by Brady Richards, CDFG ABL-Chico, 1/10/2013

<i>Sample #</i>	<i>Vial #.</i>	<i>Original ID</i>	<i>QC ID</i>	<i>comments</i>
EC-2204	3	Paratanytarsus	Rheotanytarsus	
	3	Paratanytarsus	Micropsectra	
	5	Tanytarsus	Micropsectra	
	5	Tanytarsus	Paratanytarsus	
	5	Tanytarsus	Orthocladius complex	This disputed ID also represents a difference in taxonomic precision.
	8	Tanytarsus	Micropsectra	
	10	Orthocladius complex	Limnophyes	This disputed ID also represents a difference in taxonomic precision.
	10	Orthocladius complex	Eukiefferiella	This disputed ID also represents a difference in taxonomic precision.
	10	Orthocladius complex	Parakiefferiella	This disputed ID also represents a difference in taxonomic precision.
	10	Orthocladius complex	Cricotopus	This disputed ID also represents a difference in taxonomic precision.
	14	Cricotopus bicinctus group	Parakiefferiella	This disputed ID also represents a difference in taxonomic precision.
	14	Cricotopus bicinctus group	Orthocladius complex	This disputed ID also represents a difference in taxonomic precision.
	15	Cricotopus	Micropsectra	
	23	Baetis tricaudatus	Acentrella	This disputed ID also represents a difference in taxonomic precision.
Oregon Cr	34	Sperchon	Lebertia	
	1	Cleptelmis addenda	Zaitzevia parvula	
	1	Cleptelmis addenda	Microcylloepus similis	
	1	Cleptelmis addenda	Optioservus	This disputed ID also represents a difference in taxonomic precision.
	2	Cleptelmis addenda	Zaitzevia	This disputed ID also represents a difference in taxonomic precision.

<i>Sample #</i>	<i>Vial #.</i>	<i>Original ID</i>	<i>QC ID</i>	<i>comments</i>
Oregon Cr	2	Cleptelmis addenda	Ordobrevia nubifera	
	2	Cleptelmis addenda	Optioservus	This disputed ID also represents a difference in taxonomic precision.
	3	Psephenus falli	Eubrianax edwardsii	
	5	Apedilum	Microtendipes pedellus	This disputed ID also represents a difference in taxonomic precision.
	7	Orthoclaadiinae	Stenochironomus	This disputed ID also represents a difference in taxonomic precision.
	8	Brillia	Parametriocnemus	
	9	Chaetocladius	Parametriocnemus	
	11	Parametriocnemus	Polypedilum	
	12	Paraphaenocladus	Parametriocnemus	
	19	Ophiogomphus	Octogomphus specularis	This disputed ID also represents a difference in taxonomic precision.
	20	Lepidoptera	Stenochironomus	This disputed ID also represents a difference in taxonomic precision.
	22	Ephemerella	Serratella	
	22	Ephemerella	Paraleptophlebia	
	22	Ephemerella	Tricorythodes	
	25	Chloroperlidae	Nemouridae	
	25	Chloroperlidae	Calineuria californica	This disputed ID also represents a difference in taxonomic precision.
	28	Hesperoperla	Calineuria californica	This disputed ID also represents a difference in taxonomic precision.
	30	Ecclisomyia	Lepidostoma	
	33	Acari	Torrenticola	This disputed ID also represents a difference in taxonomic precision.
	33	Acari	Mideopsis	This disputed ID also represents a difference in taxonomic precision.