Discovery
Index

Trial Preparation
Documents

(An index to the
Discovery in the
Fed Rsv Rights
Case)
April 27, 1999

NOTE:

A searchable database for the Division 1 National Forest ISF case discovery index is available on Zy-Index, under the heading “Reserved Rights Depositions.”
All "confidential" markings have been determined to be for administrative purposes, not national security information; therefore, these materials are open for access.
DISCOVERY MATERIALS -- INDEX TO BOX NO. 1

   - Interrogatories
   - Answers (by Coryell Ohlander)
   - Intra-departmental memoranda re claim
   - Technical References

   - Answers (by George J. Nagy and Hilton L. Silvey)

   - Answers by Hilton L. Silvey.

   - Answers (by Hilton L. Silvey, Coryell Ohlander, Robert J. Mulvaney)
   - Amended Applications for Confirmation of Reserved
Water Rights (Instream Flows) (Pike, Roosevelt, San Isabel, and Arapaho National Forest)


- Answers (by Hilton L. Silvey, George J. Nagy, David L. Rosgen)


- Exh. No. 1: Chapter 30 (Sept. 10, 1985)


11. Wyoming Bighorn Adjudication. Deposition of George


- U.S.A. Memorandum to Objectors, July 29, 1988.
- Interrogatories.
- Answers by Alan Berryman, Jeris A. Danielson, Michael D. Harvey, Ruh-Ming Li, J. William McDonald, Robert A. Mussetter, Marie Sansone, Stanley A. Schumm, Daryl B. Simons, Steven R. Viert.
- Certificate of Mailing.
- Exh. 2(d)(1): SLA, Review and Critique of References Used in the USFS Chapter 30 Methodology.
- Exh. 2(d)(2): SLA, Agenda for First Project Meeting with Colorado Department of Law (Apr. 29, 1986).
Exh. 2(d)(10): SLA, Letter to AGO, progress report, with enclosures: percentage of work completed by subtask; summary of data collection sites and survey dates; Dr. Simon's notes from overflight; field data collection guidance/quality control manual; watershed summary table for initial data collection sites; summary of average hydraulic conditions; cross-section, longitudinal profile, and particle size plots; draft bibliography for literature review.


Exh. 5(a): Ruh-Ming Li, Consulting projects, engineering experience, and short courses taught.

Exh. 5(b): Robert A. Mussetter, practical and research experience.

Exh. 5(c): Daryl B. Simons, resume of practical experience.

Exh. 5(d): Steven R. Viert, resume.
• Exh. 5(e): Michael D. Harvey, resume.
• Exh. 5(f): Stanley A. Schumm, resume.
• Exh. 5(g): Jeris A. Danielson, resume.
• Exh. 5(h): Alan D. Berryman, resume of practical experience.
• Exh. 6(b): Robert A. Mussetter, resume.
• Exh. 6(c): Daryl B. Simons, resume.
• Exh. 6(d): Steven R. Viert, resume.
• Exh. 6(f): Stanley A. Schumm, resume.
• Exh. 6(h): Alan D. Berryman, resume.
• Exh. 7(c): Daryl B. Simons, litigation experience.
• Exh. 8(a): Ruh-Ming Li bibliography.
• Exh. 8(c): Daryl B. Simons bibliography.
• Exh. 8(e): Michael D. Harvey bibliography.
• Exh. 8(f): Stanley A. Schumm bibliography.
• Exh. 8(g): Jeris A. Danielson bibliography.
• Exh. 10(c): Daryl B. Simons, honors, awards, committees.
• Exh. 11(a): SLA contract, Apr. 18, 1986.
• Exh. 11(d): WET contract, June 30, 1986.
• Exh. 11(e): WET contract amendment, September 3, 1986.
• Exh. 11(f): WET contract amendment, August 1, 1988.
• Exh. 12(a): Publications relied upon by Ruh-Ming Li and
Robert A. Mussetter.


* Answers by William V. Hibbert, Manager of Water Resources Planning and Development for Adolph Coors Company.


* Answers by Tom Blaue, Manager, Allenspark Water and Sanitation District.


* Answers by John Dingess; Douglas Kemper, P.E., Water Resources Engineer for the City of Aurora; David J. Fox, P.E., Assistant Water Resources Engineer for the City of Aurora.


* Answers by Randolph W. Starr.


* Answers by Robert Stieben, President of the Cache La Poudre Water Users Association.

* Exhs.: background information on E.V. Richardson.


* Answers by Thomas V. Cech, Exec. Director, CCWCD.


* Answers by Steven A. Schmitzer, Planner, Denver Water
   * Answers by Steven A. Schmitzer, Planner, Denver Water Department; Gary L. Lewis, Boyle Engineering.

   * Answers by John U. Carlson.

   * Answers by George A. McCoy, Water Resource Engineer.

   * Answers to Lynn A. Hammond; Larry D. Howard, Water Resources Engineer.

   * Answers by David F. Jankowski; Walid E. Hajj, Manager, Water Resources Engineering, City of Thornton.

   * Answers by John U. Carlson.

   * Answers by Kenneth M. Markham, President.

32. Farmers Irrigating Ditch and Reservoir Company. Answers to Applicant's First Set of Interrogatories to All Objectors. August 26, 1988.
   * Answers by F. Ray DeGood.
   * Answers by Manual Montoya, Engineering Technician; John P. Akolt III.

   * Answers by David L. Harrison.

   * Answers by Lawrence E. (Butch) Gerkin, Secretary Manager.

   * Answers by Forrest E. Cook.

   * Answers by Kim R. Lawrence.

   * Answers by John F. Scott and Jon M. Altenhofen.
   * Exh: Curriculum Vita, E.V. Richardson.

   * Answers by Donald R. Halffield, Water Resources Engineer.

   * Answers by Les Williams, Exec. Director.

-6-

* Answers by William H. Brown.

42. Water Supply and Storage Company. Answers to First Set of Interrogatories by the United States.

* Answers by Harvey J. Johnson, President.


* Interrogatories.

* Answers by Lee Silvey, Dave Rosgen, Owen Williams, George Nagy, Loren Potter, Andrew F. Watch.


* Background information on Eric Larsen, William J. Trush, Mitchell Katzel.

Exh.: Non-Visited Quantification Points.


* Exh.: Special Use Permits and Easements, Arapaho, Pike, San Isabel, and Roosevelt National Forests.


Motion.

Re-Notice.

Affidavit for Subpoena Duces Tecum.

Order, granted December 6, 1988.

47. United States. Resume and Publications List of Luna B. Leopold.


State of Colorado, Response to Request for Production of Documents.


Exh. 8(h): Publications of J. William McDonald.

Exh. 12: Publication consulted by Stanley A. Schumm.

Exh. 14: Division of Wildlife Water Rights.

DISCOVERY MATERIALS -- INDEX TO BOX NO. 3


- Deposition Volume 1.


- Deposition Volume 2.


- AGO. Letter transmitting Steven R. Viert's list of projects involving riparian areas. February 14, 1989.

- Exh. No. 1: Resume of Steven R. Viert.

- Exh. No. 2: Dave Rosgen, Short Course on River Restoration Principles and Applications (May 9-12, 1988).


- Exh. No. 4: Attachment 1, Scope of Work.


- Exh. No. 6: Additional References Relating to Vegetative Encroachment.


- Exh. No. 8: Notes, Channel Maintenance Flow With Respect to Vegetation Encroachment.

- Exh. No. 9: Vegetation Encroachment Sampling Notes.

• Exh. No. 11: Denver Water Board, Draft Vegetation Encroachment Impacts Analysis.


• Exh. No. 14: Cedar Creek Associates, Vegetation Encroachment Data Form, Rawah Creek, above diversion (August 16, 1988).

• Exh. No. 15: Cedar Creek Associates, Vegetation Encroachment Data Form, Rawah Creek, below diversion (August 16, 1988).

• Exh. No. 16: Cedar Creek Associates, Vegetation Encroachment Data Form, Laramie River, above diversion (July 17, 1988).

• Exh. No. 17: Cedar Creek Associates, Vegetation Encroachment Data Form, Laramie River, immediately below diversion (July 17, 1988).

• Exh. No. 18: Cedar Creek Associates, Vegetation Encroachment Data Form, Sand Creek, above diversion (July 16, 1988).

• Exh. No. 19: Cedar Creek Associates, Vegetation Encroachment Data Form, Sand Creek, below diversion (July 16, 1988).

• Exh. No. 20: Cedar Creek Associates, Vegetation Encroachment Data Forms, North Crestone (July 26), South St. Vrain (July 20), Maes Creek above diversion (August 2), Maes Creek below diversion (August 2), Maes Creek above diversion (pool 1), Maes Creek above diversion (riffle 2).

• Exh. No. 21: Cedar Creek Associates, Vegetation Encroachment Data Form, Cascade Creek above diversion (July 28), Cascade Creek above diversion (pool).
- Exh. No. 21A: Cedar Creek Associates, Vegetation Encroachment Data Form, Cascade Creek, below diversion (July 28), Cascade pool, below diversion.

- Exh. No. 22: Cedar Creek Associates, Vegetation Encroachment Data Form, Cotton Creek (July 26), Saguache Creek (July 27) Saguache riffle, Cotton Creek point bar.

- Exh. No. 23: Cedar Creek Associates, Vegetation Encroachment Data Form, La Plata River, below diversion (July 28); La Plata River, below diversion, riffle.

- Exh. No. 24: Cedar Creek Associates, Vegetation Encroachment Data Form, La Plata River, above diversion (July 28), riffle 1, point bar; La Plata River below diversion, point bar.

- Exh. No. 25: Cedar Creek Associates, Vegetation Encroachment Data Form, Lake Fork (July 31), riffle, point bar.

- Exh. No. 26: Cedar Creek Associates, Vegetation Encroachment Data Form, Jefferson Creek (July 26, 1988), point bar.

- Exh. No. 27: Cedar Creek Associates, Vegetation Encroachment Data Form, North Tarryall (July 25), riffle.

- Exh. No. 28: Cedar Creek Associates, Vegetation Encroachment Data Form, Little Navajo, above diversion (July 30); Little Navajo above diversion riffle replicate 2; Little Navajo below diversion (July 30); Little Navajo below diversion point bar; Little Navajo below diversion riffle.

- Exh. No. 29: Cedar Creek Associates, Vegetation Encroachment Data Form, Florida River, above diversion (July 29), riffle 2, pool replicate 1.

- Exh. No. 30: Cedar Creek Associates, Vegetation Encroachment Data Form, Florida River, below diversion (July 29), riffle 2, pool 1.

- Exh. No. 31: Cedar Creek Associates, Vegetation Encroachment Data Form, Alamosa River (August 1), point bar, riffle, pool.

- Exh. No. 32: Cedar Creek Associates, Vegetation -3-
Encroachment Data Form, Rio Blanco, below diversion (July 30), riffle, pool.

- Exh. No. 33: Cedar Creek Associates, Vegetation Encroachment Data Form, Rio Blanco above diversion (July 30), above diversion, riffle 1, pool 2, point bar 1.

- Exh. No. 34: Cedar Creek Associates, Vegetation Encroachment Data Form, Middle St. Vrain (July 20, 1988), boulder puddle, pool, pool site replicate 2, point bar area.


- Exh. No. 36: Listing of scientific names for interpretation of data sheets.

- Exh. No. 37: Map, location sketch, and field notes relating to Sand Creek site.

- Exh. No. 38: Map, location sketch, and field notes relating to Maes Creek site.

- Exh. No. 39: Map showing Little Beaver Creek site.

- Exh. No. 40: Map, location sketch, and field notes relating to North Crestone Creek site.

- Exh. No. 41: Map, location sketch, and field notes relating to Saguache Creek site.

- Exh. No. 42: Maps relating to Cotton Creek site.

- Exh. No. 43: Map and location sketches relating to Laramie River.

- Exh. No. 44: Maps relating to Florida River sites.

- Exh. No. 45: Map and field notes relating to Bennett Creek.

- Exh. No. 46: Maps relating to La Plata River site.

- Exh. No. 47: Map relating to Alamosa River site.

- Exh. No. 48: Map relating to Middle St. Vrain site.
- Exh. No. 49: Map and location sketch relating to South St. Vrain site.
- Exh. No. 50: Map, location sketch, and notes relating to Lake Fork Creek site.
- Exh. No. 51: Map and location sketch relating to Cascade Creek diversion site.
- Exh. No. 52: Map and location sketches relating to Jefferson Creek site.
- Exh. No. 53: Map and location sketches relating to North Tarryall Creek site.
- Exh. No. 54: Map relating to Little Navajo site.
- Exh. No. 55: SLA bed-load sample gradation and representative bed-material gradations.
- Exh. No. 56: Draft of SLA Report, Sec. 2.3 "Vegetation Data Collection Program," with comments.
- Exh. No. 58: DOJ, Letter to Robert v. Trout re list of field sites visited by the Forest Service with regard to stream channel changes resulting from diversion facilities.
- Exh. No. 59: DOJ, Memorandum to Objectors, Water Division No. 1, re litigation; Applicant's First Set of Interrogatories to All Objectors (July 29, 1988).
- Exh. No. 61: Drafts of Tables and Charts for vegetation encroachment analysis portion of SLA Report.
- Exh. No. 63: Draft list of references pertaining to vegetation encroachment analysis.
° Exh. No. 64: Draft of SLA Report, Chapter 6, pertaining to vegetation encroachment investigation.

° Exh. No. 65: November 16, 1988 revision of Section 2.3 of the SLA Report, with comments.

° Exh. No. 66: Draft report, Cedar Creek Site Selection and Sampling Methodology, with Preliminary Comments and Questions by Daryl B. Simons.

° Exh. No. 67: Draft of SLA Report, Chapter 6, with Mike Harvey's corrections.

° Exh. No. 68: Draft of SLA Report, Section 2.3 and Chapter 6, with Rick Harner's comments.

° Exh. No. 69: Draft of SLA Report, Chapter 6, with corrections.

° Exh. No. 70: Draft of SLA Report, Section 2.3.

° Exh. No. 71: Table [2.3], Summary of Cedar Creek Data Collection Sites.


° Exh. No. 74: Map of SLA data collection sites.


° Exh. No. 78: Fluvial Adjustments to the Spread of Tamarisk in the Colorado Plateau Region: Discussion and


- Exh. No. 84: James D. Schall and Peter F. Lagasse, Application of the Forest Service Channel Maintenance Flow Procedure.


- Exh. No. 89: William L. Graf, The Development of


- Exh. No. 96: Norman J. King, An Example of Channel Aggradation Induced by Flood Control, Short Papers in the Geologic and Hydrologic Sciences, art. 15 at B-29 (1961).


- Exh. No. 98: Photograph of Florida River above diversion, looking downstream toward diversion.

- Exh. No. 99: Photograph of Florida River below diversion, looking downstream.

-8-
• Exh. No. 100: Photograph of Florida River above diversion, looking upstream.

• Exh. No. 101: Photograph.

• Exh. No. 102: Photograph.

• Exh. No. 103: Photograph.

• Exh. No. 104: Photograph.

• Exh. No. 105: Photograph.

• Exh. No. 106: Photograph.

• Exh. No. 107: Photograph of Rio Blanco below diversion, looking upstream.

• Exh. No. 108: Photograph of Rio Blanco above diversion, looking downstream.

• Exh. No. 109: Photograph of Rio Blanco above diversion looking upstream.

• Exh. No. 110: Photograph of Rio Blanco below diversion, looking downstream.

• Exh. No. 111: Photograph of Rawah Creek, below diversion, riffle, left bank.

• Exh. No. 112: Photograph of Rawah Creek, above diversion, pool, left bank, 2d replicate.

• Exh. No. 113: Photograph of Rawah Diversion Structure.

• Exh. No. 114: Photograph of Rawah Creek below diversion, riffle, left bank, close-up of moss.


• Exh. No. 116: Photograph of Rawah Creek, Below Diversion, Riffle, right bank.

• Exh. No. 117: Photograph of Rawah Creek, below diversion, downstream.

• Exh. No. 118: Photograph of Rawah Creek, above diversion.
Exh. No. 119: Photograph of Rawah Creek, above diversion, upstream.

Exh. No. 120: Photograph of Rawah Creek, below diversion, upstream.

Exh. No. 121: Photograph of Little Navajo, above diversion, looking upstream.

Exh. No. 122: Photograph of Little Navajo below diversion, looking downstream.

Exh. No. 123: Photograph of Little Navajo below diversion, looking upstream.

Exh. No. 124: Photograph of La Plata below diversion, looking downstream.

Exh. No. 125: Photograph of La Plata below diversion, looking upstream.

Exh. No. 126: Photograph of La Plata River, above diversion, looking upstream.

Exh. No. 127: Photograph of La Plata River above diversion, looking downstream.

- Exh. No. 128: SLA Report, Table 2.2, Summary of Data Collection Sites, with notations.
- Exh. No. 129: Chart 12, pool.
- Exh. No. 130: Chart 13, pool.
- Exh. No. 131: Chart 14, pool.
- Exh. No. 132: Charts 15 and 16, point bar.
- Exh. No. 133: Charts 6 and 17, point bar.
- Exh. No. 134: Charts 11, 9, and 10, total stream.
- Exh. No. 136: Charts 6, 40, and 6, misc. graphs.
- Exh. No. 137: Charts 18, 19, and 20, riffles.
- Exh. No. 138: Charts 5, 6, and 7, riffles.
- Exh. No. 139: Charts 24, 25, and 26, pools.
- Exh. No. 141: Tables, gradient -- encroachment.
- Exh. No. 142: Miscellaneous, SLA table: data collection sites summary (preliminary); notes, outline, memorandum, photographs, graphs.
- Exh. No. 143: Graphs, "original false premise."
- Exh. No. 144: Tables, sketches, gradient -- vegetation.
- Exh. No. 145: Table, submongo subset, vegetation, SmG, and SPGM.
- Exh. No. 146: Tables, point bar hits.
Exh. No. 147: Tables, point bar hits.
Exh. No. 149: Calculations.
Exh. No. 150: Flow chart for determining encroachment potential.
Exh. No. 151: Flow chart for determining vegetation encroachment potential.
Exh. No. 154: Table.
Exh. No. 155: Table.
Exh. No. 156: Table.
Exh. No. 157: Copy of mongo table.
Exh. No. 158: Tables, percentages of point bar hits.
Exh. No. 159: SLA Table 1, Data collection sites summary, preliminary.
Exh. No. 161: Table, field work.
Exh. No. 162: Graph, with calculations.
Exh. No. 163: Graph.
Exh. No. 164: Map of data collection sites with notations.
Exh. No. 165: Notes re diversion sites.
Exh. No. 166: Notes re diversion sites.
Exh. No. 167: Notes re diversion sites.
- Exh. No. 168: Notes re diversion sites.
- Exh. No. 169: Notes re diversion sites.
- Exh. No. 170: Sketch of diversion site.
- Exh. No. 171: Laramie Poudre Tunnel, transmountain diversion, discharge information.
- Exh. No. 172: Notes re diversion sites, Maes Creek and Sand Creek.
- Exh. No. 173: Discharge information for Cascade Creek Diversion.
- Exh. No. 174: Notes re diversion sites, La Plata and Rio Blanco.
- Exh. No. 175: Notes re diversion site, Florida River.
- Exh. No. 176: Memorandum to Steve Viert from Ken Beegles, Water Division 7, re diversion sites.
- Exh. No. 177: Page two of Memorandum from Ken Beegles, Water Division 7, to Steve Viert re diversion sites.
- Exh. No. 178: Map of San Juan National Forest.
- Exh. No. 179: Notes re Division 7 diversion sites.
- Exh. No. 180: Tables re USBR Rio Blanco diversion site, Cascade Canal, Florida River Estates Place, Florida Canal, Hay Gulch Ditch, La Plata Irrigation Ditch, USBR Little Navajo Diversion sites.
- Exh. No. 181: Letter to Steven R. Viert from Scott D. Brinton, Water Division 7, re stream flow records: La Plata River at Hesperus, Florida River and Lemon Reservoir, Florida River below Florida Farmers Ditch, Rio Blanco below Blanco Diversion Dam, Little Navajo River below Little Oso Diversion.
- Exh. No. 183: Diversion Records, Little Navajo River below Little Oso Diversion Dam, near Chromo, CO.
Exh. No. 184: Diversion records Rio Blanco below Blanco Diversion Dam, near Pagosa Springs.

Exh. No. 185: Diversion records, Florida River below Florida Farmers Ditch, near Durango, CO.

Exh. No. 186: Colorado Division of Water Resources Summary of Discharge, Florida River above Lemon Reservoir, near Durango, CO.

Exh. No. 187: Colorado Division of Water Resources, Summary of Discharge, Florida River below Lemon Reservoir, near Durango, CO.

Exh. No. 188: Colorado Division of Water Resources, Summary of Discharge, La Plata River at Hesperus, CO.

Exh. No. 189: Discharge Records, La Plata River at Hesperus, CO.

Exh. No. 190: Discharge Records, La Plata River at Hesperus, CO.


Exh. No. 195 Little Beaver Creek 59D1
Exh. No. 196 Middle Fork St. Vrain Creek 47E1
Exh. No. 197 North Tarryall Creek 1B
Exh. No. 198 Lake Fork Creek 27L1
Exh. No. 199 South Fork Rock Creek 27S2
Exh. No. 200 Bennett Creek 29D

-4-
<table>
<thead>
<tr>
<th>Exh. No.</th>
<th>Creek Name</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>Beaver Creek</td>
<td>31B</td>
</tr>
<tr>
<td>202</td>
<td>Woodfern Creek</td>
<td>35J</td>
</tr>
<tr>
<td>203</td>
<td>Bennett Creek</td>
<td>29F1</td>
</tr>
<tr>
<td>204</td>
<td>West Willow Creek</td>
<td>41F1</td>
</tr>
<tr>
<td>205</td>
<td>South Carnero Creek</td>
<td>45D</td>
</tr>
<tr>
<td>206</td>
<td>Elkhorn Gulch</td>
<td>53C9</td>
</tr>
<tr>
<td>207</td>
<td>Big Dry Gulch</td>
<td>51F</td>
</tr>
<tr>
<td>208</td>
<td>Alamosa Creek</td>
<td>27C</td>
</tr>
<tr>
<td>209</td>
<td>South St. Vrain Creek</td>
<td>47D2</td>
</tr>
<tr>
<td>210</td>
<td>Jefferson Creek</td>
<td>1E</td>
</tr>
<tr>
<td>211</td>
<td>North Crestone Creek</td>
<td>55A1</td>
</tr>
<tr>
<td>212</td>
<td>Saguache Creek</td>
<td>47J, 47G, 47H</td>
</tr>
<tr>
<td>213</td>
<td>Cotton Creek</td>
<td>53G6</td>
</tr>
<tr>
<td>214</td>
<td>Mosca Creek</td>
<td>57B1</td>
</tr>
<tr>
<td>215</td>
<td>Fourmile Creek</td>
<td>45E1</td>
</tr>
<tr>
<td>216</td>
<td>Fish Creek</td>
<td>55B1</td>
</tr>
<tr>
<td>217</td>
<td>Laramie River</td>
<td>67A8</td>
</tr>
<tr>
<td>218</td>
<td>Sand Creek</td>
<td>71A2</td>
</tr>
<tr>
<td>219</td>
<td>Wigwam Creek</td>
<td>5E</td>
</tr>
<tr>
<td>220</td>
<td>Payne Gulch</td>
<td>9C</td>
</tr>
<tr>
<td>221</td>
<td>Deer Creek</td>
<td>11B</td>
</tr>
<tr>
<td>222</td>
<td>South Fork South Platte River</td>
<td>98K</td>
</tr>
<tr>
<td>223</td>
<td>South Fork Chicago Creek</td>
<td>37B2</td>
</tr>
<tr>
<td>Exh. No.</td>
<td>Creek Name</td>
<td>Footage</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>224</td>
<td>Fall River</td>
<td>37J1</td>
</tr>
<tr>
<td>225</td>
<td>Halfmoon Creek</td>
<td>2.2</td>
</tr>
<tr>
<td>226</td>
<td>Poncha Creek</td>
<td>2.5</td>
</tr>
<tr>
<td>227</td>
<td>Grape Creek</td>
<td>2.6</td>
</tr>
<tr>
<td>228</td>
<td>Maes Creek</td>
<td>2.8</td>
</tr>
<tr>
<td>229</td>
<td>Bear</td>
<td>2.12</td>
</tr>
<tr>
<td>230</td>
<td>Pass Creek</td>
<td>2.14</td>
</tr>
<tr>
<td>231</td>
<td>Stout Creek</td>
<td>2.15</td>
</tr>
<tr>
<td>232</td>
<td>Brown's Creek</td>
<td>2.16</td>
</tr>
<tr>
<td>233</td>
<td>Trout Creek</td>
<td>2.17</td>
</tr>
<tr>
<td>234</td>
<td>Morrison Creek</td>
<td>7.11</td>
</tr>
<tr>
<td>235</td>
<td>Wolf Creek</td>
<td>7.2</td>
</tr>
<tr>
<td>236</td>
<td>Devil Creek</td>
<td>7.4</td>
</tr>
<tr>
<td>237</td>
<td>Miller Creek</td>
<td>7.6</td>
</tr>
<tr>
<td>238</td>
<td>Cascade Creek</td>
<td>7.8</td>
</tr>
<tr>
<td>239</td>
<td>Coon Creek</td>
<td>7.9</td>
</tr>
<tr>
<td>240</td>
<td>Bear Creek</td>
<td>7.10</td>
</tr>
<tr>
<td>241</td>
<td>Turkey Creek</td>
<td>7.16</td>
</tr>
<tr>
<td>242</td>
<td>Cottonwood Creek</td>
<td>7.18</td>
</tr>
<tr>
<td>243</td>
<td>Middle Mancos Creek</td>
<td>7.19</td>
</tr>
</tbody>
</table>


* Order for Commission to Take Deposition Outside the State of Colorado, together with the underlying Motion for Commission to Take Deposition Out of State,
Re-Notice of Deposition, and Affidavit for Subpoena Duces Tecum

- Deposition Subpoena for Personal Appearance and Production of Documents and Things; Proof of Service.
- Exh. No. 244: Resume and Publications List of Dr. Leopold.
- Exh. No. 245: 1987 Office of the State Engineer Map of the Water Division, District, Designated Ground Water Basins, and Management District Boundaries.
- Exh. No. 251: Index to Attachments to United States' Memorandum in Opposition to Motion for Partial Summary Judgment (legislative history materials).
- Exh. No. 252: Analysis of Streams Studied.
- Exh. No. 253: E. D. Andrews, Bed-material entrainment and hydraulic geometry of grave-bed rivers in Colorado,


- Exh. No. 261: Photograph of Iceburg Reach, Poudre Pass Creek.

- Exh. No. 262: Photograph of Talus Deposit, Stout Creek Valley.

- Exh. No. 263: Photograph of Little Beaver Creek.

- Exh. No. 264: Photograph of North Crestone Creek.

- Exh. No. 265: Photograph of Cascade Creek.

- Exh. No. 266: Photograph of Fish Creek.
Exh. No. 267: Photograph of Saguache Creek.

Exh. No. 268: Photograph of Jefferson Creek, Pike National Forest.

Exh. No. 269: Photograph of Lake Fork Creek.


58. Author not identified. Chapter 30, Draft No. 11, July 6, 1984, with marginal notations.


60. Author not identified. Comments on Chapter 30, Draft No. 11, July 6, 1984.


68. Dave Rosgen. Comments on Chapter 30, Draft No. 7, May 7,


75. Charles A. Troendle, Principal Hydrologist, Rocky Mountain Forest and Range Experiment Station. Chapter 30 review. September 5, 1984.


* Virgil Hill, President. Agricultural Ditch and Reservoir Company.

* Kenneth R. Wright, Wright Water Engineers, Inc.

* Jonathan E. Jones, Wright Water Engineers.

* Kristine Verdin, Wright Water Engineer.

* Patricia K. Flood, Wright Water Engineers.

* Harold F. Bishop, Bishop-Brogden Associates, Inc.
* Bruce E. Jones, Bishop-Brogden Associates.


* Dennis Bode, hydrologic engineer, City of Fort Collins.
* Elmer R. Gustafson.
* E. V. Richardson.
* Jeris A. Danielson, State Engineer.
* Alan D. Berryman, Division Engineer.
* Jon Altenhofen, NCWCD.
* John Scott, NCWCD.
* Charles F. Leaf.
* Norman Wengert.


* Witnesses: Kenneth A. Abrahamson, Mountain Manager, Loveland Ski Areas, Clear Creek Skiing Corporation.


Steven A. Schmitzer, Planner, Denver Water Department.

Gary Lewis, Boyle Engineering Corporation.


Witnesses: Michael B. Smith, Director of Water Utilities, City of Fort Collins.

Dennis Bode, Water Resources and Planning Manager, City of Fort Collins.


Witnesses: James Reed, Mayor, City of Idaho Springs.

Jonathan E. Jones, Wright Water Engineers.


Witnesses: Walid E. Hajj, Manager, Water Resources Engineering, City of Thornton.

Michael J. Sullivan, City of Thornton.


Jack Ethredge, City Manager.

Ron Lovan, Assistant Utilities Director.

- Witnesses: Richard G. Rosecrans, Manager.


- Witnesses: George A. McCoy, Engineer, City of Greeley.


- Witnesses: Kenneth M. Markham, President.

- Delbert Helzer, Secretary and Manager.


- Witnesses: Larry D. Simpson, General Manager.

- Jonathan M. Altenhofen, Water Resources Engineer.

- John F. Scott, Water Resources Engineer.

- Jeris A. Danielson, State Engineer.

- Alan D. Berryman, Division Engineer.

- George Sievers, Water Commissioner.

- Donald L. Brazelton, Water Commissioner.
- Carolyn Vanaorsdal, Water Commissioner.
- J. William McDonald, Director, CWCB.
- Uli Kappus, Exec. Director, Colorado Water Resources and Power Development Authority.
- Denver Water Board employees.
- E. V. Richardson.
- Charles F. Leaf.
- Norman I. Wengert.

- Witnesses: Donald R. Halffield, Water Resources Engineer.
- Randolph A. Rhodes, Water Coordinator.

- Witnesses: Jeris A. Danielson, State Engineer.
- Alan D. Berryman, Division Engineer.
- J. William McDonald, Director, Colorado Conservation Board.
- Stanley A. Schumm, Water Engineering and Technology.
- Michael D. Harvey, Water Engineering and Technology.
- Steven R. Viert, Cedar Creek Associates.
- Ruh-Ming Li, Simons, Li & Associates.
- Robert A. Mussetter, Simons Li & Associates.
- Daryl B. Simons, Simons & Associates.

97. Omitted.

98. St. Vrain and Left Hand Water Conservancy District,

- Witnesses: Les Williams, Exec. Director, St. Vrain.
- Vern Peppler, President, St. Vrain.
- Thomas Blaue, Manager, Allenspark Water and Sanitation.
- Vern Butler, President, Upper South Platte.
- Robert Conroe, Sacred Mountain Ashram.
- Frank Gould, Director, St. Vrain, Left Hand Ditch Co., and Left Hand Water Supply Co.
- Boyd La Marsh, General Manager of the Aspen Lodge.
- Robert J. Akins, President, R.J.A.
- Scott Kirby, Convenant Heights Conference Center.
- Don Newton, President, Meadow Mountain Water Supply Co.
- Robert C. Brand, Rocky Mountain Consultants.
- James A. Cinea, Water Resources, City of Longmont.
- Donald Q. Palmer, Water Commissioner.
- Jeris A. Danielson, State Engineer.
- Alan D. Berryman, Division Engineer.
- Tom Cech, Manager, Central Colorado Water Conservancy District.


Bo Stewart, hydrologist, Arapaho-Roosevelt National Forest.

George M. Leonard, Associate Chief, Forest Service.

Gray F. Reynolds, Director, Watershed and Air Management Staff, Forest Service.

Gary Cargill, Regional Forester.

Owen Williams, hydrologist, National Park Service.

Hilton Lee Silvey, hydrologist, Forest Service retiree.

Harold K. Steen, historian.

Roderick Nash, historian.

Edmund D. Andrews, USGS.

Richard Madole, USGS.

Gordon C. Jacoby, dendrochronologist.

David Dawdy, hydrologist and hydrology consultant.

Loren D. Potter, plant ecologist.

David L. Rosgen, hydrologist.

Robert Balling, climatologist.

Luna B. Leopold, geomorphologist.

Steven A. Boand, hydrology.


Answers by Steven A. Schmitzer and Gary Lewis.


Answers by Les Williams, Exec. Director.

Expert witness information -- Robert Brand.

-8-

- Answers by Carol D. Angel, Alan D. Berryman, Jeris A. Danielson, Michael D. Harvey, Ruh-Ming Li, J. William McDonald, Grady O'MeNeill, Robert A. Mussetter, Marie Sansone, Stanley A. Schumm, Daryl B. Simons, Steven R. Viert.

- Exh. No. 8(H): Publications List, J. William McDonald.

- Exh. No. 12(b): References relied upon by Stanley A. Schumm.

- Exh. No. 14: Division of Wildlife water rights.


- Answers by Elmer Gustafson, President; Jon Altenhofen, NCWCD.


107. Luna B. Leopold. The Sediment Size that Determines Channel Morphology (Draft).


121. City and County of Denver. First Set of Request for Admissions, Interrogatories, and Request for Production of Documents to the Applicant.


  * Exhs.: Maps and location sketches re: diversion sites studied.


130. United States. Response to Objection St. Vrain and Left Hand Water Conservancy District's First Set of Requests for
Admissions, Interrogatories, and Request for Production of Documents. February 17, 1989.


144. State of Colorado and NCWCD. Joint Notice of Deposition and Request for Production of Documents: Garret T. Decker.
March 8, 1989.


171. United States. Response to Motion of Objector St. Vrain and Left Hand Conservancy District's for Order Compelling


- VV-1, Decree, W-9288-76, Lower Lone Pine Lake.
- VV-2C, Decree, 82-CW-300, Upper Lone Pine Lake, diligence.
- VV-2E, Decree, 86-CW-221, Upper Lone Pine Lake, diligence.
- VV-2F, Decree, 87-CW-209, Upper Lone Pine Lake, diligence.


- Exh. No. 3: Biographical Data Sheet, Gary E. Cargill.
- Exh. No. 4: Organizational Chart, Chief's Office.
- Exh. No. 6: Lee Silvey and Dave Rosgen, Rocky Mount—
tain Region, Forest Service, "'Hysed': A Water Resource Analysis Model for Forest Land Use Planning (June 1980)."

Exh. No. 7: Craig W. Rupp, Regional Forester. Memorandum to Forest Supervisors, Arapaho and Roosevelt NF's and Pike and San Isabel NF's. Instream Flow Quantifications for Water Division 1, State of Colorado (September 27, 1983).


- Deposition Volume 1.
- Deposition Volume 2.
- Deposition Volume 3.
- Exh. No. 6: SLA. Progress Report No. 1. June 16, 1988. Enclosures: Percentage of Work Completed by Subtask; Summary of Data Collection Sites and Survey Dates; Dr. Simon’s Notes from Overflight of Areas for Study for Colorado Attorney General Study; Field Data Collection Guidance/Quality Control Manual; Watershed Summary Table for Initial Data Collection Sites; Summary of Average Hydraulic Conditions; Cross-section, longitudinal profile, and particle size plots; and draft bibliography for literature review.
- Exh. No. 7: Photograph of Willow Creek, large gravel, small cobble bed stream.
- Exh. No. 8: Photograph of Joe Wright Creek.
- Exh. No. 9: Photograph of Middle Cabin Creel.
- Exh. No. 10: Photograph of Gold Creek, Idaho.
- Exh. No. 11: Photograph of Upper Section of Upper Trap Creek.
* Exh. No. 12: Photograph of Upper Trap Creek.
* Exh. No. 14: SLA. Review and Critique of References Used in the USFS Chapter 30 Methodology.
* Exh. No. 15: Graph, discharge -- bedload size.
* Exh. No. 16: Graph, discharge -- bedload sediment.


182. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Development of Models for Predicting Water and Sediment Routing and Yield From Storms on Small Watersheds (prepared by D.B. Simons, R.M. Li, and M.A. Stevens August 1975).


185. Robert A. Mussetter and Ruh-Ming Li. Aggradation/Degradation Study of San Juan & Trabuco Creek, Orange County, California.


187. Patricia L. Wiberg and J. Dungan Smith. Calculations of
the Critical Shear Stress for Motion of Uniform and Heterogeneous Sediments, 23 Water Resources Research 1471 (August 1987).


192. CWCB. Debris and Flood Control Plan for Portland and Cascade Creeks at Ouray, Colorado (Final Report October 25, 1982).


DISCOVERY MATERIALS -- INDEX TO BOX NO. 8


208. SLA. Letter to AGO and proposal for supplemental field


210. SLA. Potential Impact of USFS Channel Maintenance Flows on Downstream Reaches and Structures. C-NP.


   ° Answers by Hilton Lee Silvey.


   ° Answers by George J. Nagy and Hilton Lee Silvey.

   ° Answers by Hilton Lee Silvey.

   ° Answers by George J. Nagy and Hilton Lee Silvey.

   ° Answers by George J. Nagy and Cathleen A. Zillich.


* Answers by Michael J. Sullivan, Water Resources Engineer; Brian Fitzpatrick, Water Resources Analyst; David F. Jankowski.


   * Answers by George J. Nagy, Lynn A. Johnson.


247. NCWCD. Reply to Applicant's Response to Motion for Order Compelling Discovery. April 7, 1989.


249. United States Department of Agriculture. Forest Service Field Office Chart.


252. NCWCD. First Requests for Admissions and Fourth Set of Interrogatories and Requests for Production of Documents to the United States. April 13, 1989.


259. NCWCD. Response to United States' First Request for Pro-
duction of Documents to All Objectors. April 19, 1989.

   - Summary
   - Draft Environmental Impact Statement
   - Proposed Land and Resource Management Plan

   - Volume I
   - Volume II
   - Land and Resource Management Plan

   - Record of Decision
   - Final Environmental Impact Statement


-3-
• Thompson Water Users Association. Amendments to Constitution and By-Laws.

• Thompson Water Users Association Membership List.


• Notice of Deposition and Production of Documents.

• Deposition Transcript Volume 1.


• Exh. No. 3: Tabulation of water rights.

• Exh. No. 4: Findings and Ruling of the Referee and Decree of the Water Court, In the Matter of the Application for Water Rights of Colorado Water Conservation Board, in Boulder County, District Court, Water Division 1, Colorado, Case No. W-8384-76.

• Exh. No. 5: Lists of Authorized Water Users for the Arapaho, Pike, and Roosevelt National Forests.

• Exh. No. 6: List of Authorized Water Users for the Arapaho, Pike, and Roosevelt National Forests, showing State permits and easements.

• Exh. No. 7: Questionnaire, list concerning 1984 resume.


• Exh. No. 9: Water District 4, Affected Water Rights.

-4-
- Exh. No. 11: Ralph Van Gorden, Water District No. 9, Memorandum to Deputy Division Engineer Ed Blank re: affected water rights. July 18, 1989.
- Deposition Transcript Volume II.


274. CWCB. Colorado Dam Site Inventory. October 1987.

275. SLA. Agenda for First Project Meeting with Colorado Department of Law.
276. SLA. Solution Algorithm for Channel Stability Analysis.


286. Enartech. Letter to SLA re: field notes for Rio Grande sites; stream discharge summary; channel stability rating; and the location of each study reach.


AG Alpha No. LW FR HRDJ
AG File No. DNR8902333/KJ


305. SLA. Classification of U.S.F.S. Quantification Points.

306. SLA. Halfmoon Creek -- 1986 Field Notes.

307. SLA. Halfmoon Creek -- Summary File.

308. SLA. Lake Creek -- 1986 Field Notes.

309. SLA. Poncha Creek -- 1986 Field Notes.

310. SLA. Poncha Creek -- Summary File.

311. Omitted.

312. SLA. Grape Creek -- 1986 Field Notes.

313. SLA. Grape Creek -- Summary File.

314. SLA. Bear Creek (2.12) -- 1986 Field Notes.

315. SLA. Bear Creek (2.12) -- Summary File.

316. SLA. Pass Creek -- 1986 Field Notes.

317. SLA. Pass Creek -- Summary File.

318. SLA. Stout Creek -- 1986 Field Notes.

319. SLA. Stout Creek -- Summary File.

320. SLA. Brown's Creek -- 1986 Field Notes.

321. SLA. Brown's Creek -- Summary File.

322. SLA. Trout Creek -- 1986 Field Notes.

323. SLA. Trout Creek -- Summary File.
324. SLA. Wolf Creek -- 1986 Field Notes.
325. SLA. Wolf Creek -- Summary File.
326. SLA. Devil Creek -- 1986 Field Notes.
327. SLA. Devil Creek -- Summary File.
328. SLA. Miller Creek -- 1986 Field Notes.
329. SLA. Miller Creek -- Summary File.
330. SLA. Coon Creek -- 1986 Field Notes.
331. SLA. Coon Creek -- Summary File.
332. SLA. Bear Creek (7.10) -- 1986 Field Notes.
333. SLA. Bear Creek (7.10) -- Summary File.
334. SLA. Morrison Creek -- 1986 Field Notes.
335. SLA. Morrison Creek -- Summary File.
336. SLA. Turkey Creek -- 1986 Field Notes.
337. SLA. Turkey Creek -- Summary File.
338. SLA. Cottonwood Creek -- 1986 Field Notes.
339. SLA. Cottonwood Creek -- Summary File.
340. SLA. Middle Mancos River -- 1986 Field Notes.
341. SLA. Middle Mancos River -- Summary File.
342. SLA. Big Dry Gulch -- 1986 Field Notes.


369. Jan Strahan. The Effects of Streamflow Regulation on Riparian Seedling Establishment and Survival 34-41.


376. Ronald J. Pelzman, California Department of Fish and Game. Causes and Possible Prevention of Riparian Plant Encroachment on Anadromous Fish Habitat (Environmental Services Branch Administrative Report No. 73-1) (January 1973).


   - Gordon Creek, quantification point 61 G
   - Elkhorn Creek, quantification point 61 F2

   - Caribou Creek, quantification point 45 D3


-6-


399. The National Archives, National Archives and Records Service. Preliminary Inventory of the Records of the Forest Service (compiled by Harold T. Pinkett, revised by Terry W. Good) (Record Group 95, 1969).


- Interrogatories.


- Denver I.


- Exh. 1(c): Bill McDonald, Memorandum to CWCB re Negotiations of Indian Reserved Water Rights Claims, January 7,
1985.


* Exh. 3: References relating to Meyer-Peter, Muller bed load equations.

* Exh. 4: References relating to the application of the Meyer-Peter, Muller bed load equation to mountain streams.


* Motion for Protective Order.

* Answers by George J. Nagy, Hilton L. Silvey, Daria J. Zane, Luna B. Leopold.

* Attachment No. 1: Inventory of Channel Stability Slide Series.

* Attachment No. 2: David L. Rosgen, Total Potential Sediment, Chapter VI in An Approach to Water Resources Evaluation of Non-Point Silvicultural Sources (A Procedural Handbook) (WRENSS) (U.S. EPA Environmental Research Labora-


Attachment No. 3: Excerpts from the transcript of Luna B. Leopold's deposition.


* Trout Creek, quantification point 6A.


* Answers by Ward H. Fischer, Jon Altenhofen, John Scott, Charles F. Leaf.


415. SLA. National Forest Stream Studies Aerial Reconnaissance,
September 16 & 17, 1986, Data Notebook.


- Index, prepared by Ceclea Little, AGO. C-NP.
- Summary.
- Volume I.
- Volume II, Appendix 1-A, Mitigation.
- Volume IV, Appendix 1-G, Comments and Responses.
- Volume V, Appendix 1-G, Letters of Comment.

418. Dave Rosgen. Final Lecture Schedule (Institute on Fluvial Processes July 5-9, 1982).

- Chapter 3: Jose D. Salas, Variability of Flows.
- Chapter 4: Jose D. Salas, Simulation of Flows.
- Chapter 6: M.E. Moss, Evaluation of Hydrologic Data Networks.
- Chapter 8: H.W. Shen, Wash Load and Bed Load; Appendix -4-


Chapter 11: D.B. Simons, Recent Case Studies.

Chapter 12: Ruh-Ming Li, Erosion From Watersheds.

Chapter 13: Ning Chien, Soil Erosion and Conservation in the Middle Reaches of the Yellow River.


Chapter 16: William A. Thomas, The HEC-6 and the Newly Developed Strip Model.

Chapter 17: William A. Thomas, Case Studies on the Use of Mathematical Models by the U.S. Army Corps of Engineers.


Chapter 19: Ning Chien, Changes in River Regime after the Construction of Upstream Reservoirs.

Chapter 20: Ning Chien, Reservoir Sedimentation.


422. State of Colorado and NCWCD. Joint Notice of Deposition


- A. Allen Dyer, Department of Forestry and Wood Sciences, Colorado State University, Forestry Management in the Rocky Mountains.
- Dave Anderson, Director for Planning and Public Information, U.S. Forest Service, Region II, Implementation of Planning Requirements in Rocky Mountain Forests.


439. State of Colorado. Anticipated Field Data Collection and


447. Stephen C. Porter, Kenneth L. Pierce, and Thomas D. Hamilton, Late Wisconsin Mountain Glaciation in the Western United States, Chapter 4, in The Late Pleistocene 71-111 (Stephen C. Porter, ed.) in Volume 1, Late-Quaternary Environments of the United States (H.E. Wright, Jr., ed., Univ. of Minnesota Press, Minneapolis).


460. M.P. Mosley, Prediction of Hydrologic Variables from Channel Morphology, South Island Rivers 109-20 (Forest Research Institute, P.O. Box 31-011, Christchurch).


- Answers by Les Williams, Executive Director.


- Answers by Les Williams, Executive Director.


472. William W. Emmett, The Channels and Waters of the Upper

-2-


482. A.M. Harvey, Channel Capacity and the Adjustment of Streams to Hydrologic Regime, 8 Journal of Hydrology 82-98 (1969).

483. Micha Klein, Drainage Area and the Variation of Channel Ge-

485. M.D. Newson, Mountain Streams.


   " Chicago Creek, quantification point 37 B 2.
   " South Fork Chicago Creek.


   " Joint Re-Notice of Deposition and Request for Production of Documents.
   " Deposition Transcript.
   " Exhibit No. 1: Curriculum Vitae and Publications List.
   " Exhibit No. 2: Joint Re-Notice of Deposition and Request for Production of Documents.
Exhibit No. 4: Applicant United States of America's Answers to the State of Colorado's Second Set of Interrogatories and Requests for Production of Documents, January 16, 1989.

Exhibit No. 5: United States Forest Service Anticipated Field Data Collection and Analysis, 1989 Summer Field Season. May 1, 1989.

Exhibit Nos. 6 & 7: Withdrawn

Exhibit No. 8: SLA Report, Appendix B, Glossary.


Exhibit No. 10: Dr. Potter's time sheets (notes).

Exhibit No. 11: Methodology -- Sampling Stream Vegetation.


Fraser River, Elk Creek, St. Louis Creek, Steelman Creek, Bennett Gulch, Chapman Bulch, Lostman Creek, Halfmoon Creek, Jefferson Creek, McQuerry Creek, Ranch Creek.

Potter photographs -- 1988 Field visits.

Forest Service: 1988 Vegetation Data Sheets: Fraser River above diversion, Fraser River below diversion, Fraser River above diversion, Jim Creek above diversion, Jim Creek below diversion, St. Louis Creek above meander, St. Louis Creek below meander, Steelman Creek above diversion, Steelman Creek below diversion, Bennett Gulch above diversion, Bennett Gulch below diversion, Lost Man Creek below diversion, Lost Man Creek above B-2 Straight Reach, Lost Man Creek below reservoir, McQuery Creek below diversion.

29 (September 1976).

492. Dave Rosgen, Short Course on River Restoration Principles and Applications (Frostburg, Maryland, May 9-12, 1988).


511. Thomas E. Lisle, Effects of Aggradation and Degradation on Riffle-Pool Morphology in Natural Gravel Channels, Northwestern California, 18 Water Resources Research 1643-51


525. W.A. Harenberg, Using Channel Geometry to Estimate Flood Flows at Ungaged Sites in Idaho, U.S.G.S. Water-Resources Investigations 80-32 (prepared in cooperation with the Idaho Transportation Department, Division of Highways August 1980).


* Answers by: Nicholas C. Ionnides, CWCB; Eugene I. Jenscok, CWCB; J. William McDonald, CWCB; David B. Park, CWCB; Stanley A. Schumm.
Bear Creek Lake; absolute decree for piscatorial purposes, conditional decree for municipal, domestic, irrigation, and recreation purposes; Bear Creek; Turkey Creek.

Morrison Exchange Reservoir; conditional decree for municipal, industrial, recreational, and other beneficial uses; Bear Creek.


CWCB Minimum Lake Level Program-Summary Listing, Water Division 1.

DOI State Industrial School water rights (Lookout Mountain School), Clear Creek.

DOI Mountainview School water rights, Harriman Lake Reservoir, Bear Creek and Turkey Creek.

DOI Fort Logan Mental Health Center water rights, Simonton Ditch, Bear Creek.


- Renounce of Deposition and Production of Documents, April 26, 1989.

- Exhibit No. 1: Curriculum Vitae.
- Exhibit No. 2: Time Sheets.
- Exhibit No. 3: Dr. Harvey's Field Notes, June 30, 1986 and July 1, 1986 (Wet Mountains, Arkansas River drainage, and South Platte drainage).
- Exhibit No. 4: Dr. Harvey's Field Notes, July 15, 1986 and July 17, 1986 (Laramie River, Little Beaver Creek, Middle St. Vrain Creek, South St. Vrain Creek, and Fall River).
- Exhibit No. 5: Dr. Harvey's Field Notes, August 18, 1988 and October 6, 1988 (Left Hand Creek, James Creek, Spring Gulch, South St. Vrain Creek, Middle St. Vrain Creek, Little Beaver Creek).
- Exhibit No. 7: Michael D. Harvey, Steepland Channel Response to Episodic Erosion (Doctoral Dissertation 1980).
- Exhibit No. 8: Hand-drawn diagram by Dr. Harvey.
- Exhibit No. 9: Cross-section profiles, page 150 from Dr. Harvey's dissertation.
- Exhibit No. 10: Longitudinal Profile of the Little South Fork, page 35 of Dr. Harvey's dissertation.
- Exhibit No. 11: Handwritten List of Adjustable Channels.
• Exhibit No. 15: Draft of Chapter 6, Vegetation Encroachment Investigation, SLA Report, with Dr. Harvey's marginal comments.


• Notice of Deposition and Production of Documents.

• Exhibit No. 1: Reports Consulted by Dr. Schumm.

• Exhibit No. 2: Dr. Schumm's Resume and Bibliography.

• Exhibit No. 3: Handwritten List of Creeks visited by Dr. Schumm.

• Exhibit No. 4: WET Contract, June 30, 1986.

• Exhibit No. 5: WET Contract Amendment, September 3, 1986.

• Exhibit No. 6: WET Second Contract Amendment, August 1, 1988.

• Exhibit No. 7: Dr. Schumm's Notes on Chapter 30.

• Exhibit No. 8: Dr. Schumm's handwritten notes on the case.

-6-
Exhibit No. 9: Notes relating to the hydraulic geometry of stream channels.

Exhibit No. 10: Dr. Schumm's Notes, Chapter 30 Review, April 22, 1988.

Exhibit No. 11: Dr. Schumm's Notes.

Exhibit No. 12: SLA proposal, section III, Technical Approach and Implementation, Task A: Critique of Forest Service Quantification Methodology.

Exhibit No. 13: Dr. Schumm's Notes.

Exhibit No. 14: Sketch.

Exhibit No. 15: SLA Report, Table 2.2, Summary of SLA Date Collection Sites.

Exhibit No. 16: Sketch.

Exhibit No. 17: Dr. Schumm's Notes from Tape of June 30 and July 1, 1989 field trip.

Exhibit No. 18: Dr. Schumm's Notes from Tape of July 15 and July 17, 1986 field trip.

Exhibit No. 19: Dr. Schumm's notes from Tape of helicopter fly-over, September 16, 1986.

Exhibit No. 20: Dr. Schumm's Notes from Tape of August 18, 1988 field trip.

Exhibit No. 21: Dr. Schumm's Notes from Tape of Trip to Inspect Rosgen Sites, May 1989.

Exhibit No. 22: United States Transcript of the June 30 and July 1, 1986 Field Notes Tape.

Exhibit No. 23: Unites States Transcript of the Tape of Trip to Inspect Rosgen Field Sites.


Exhibit No. 25: Time Sheets.

Exhibit No. 27: Letter from Stanley A. Schumm to John R. Hill, Jr., Department of Justice, January 31, 1986.


Exhibit No. 31: Dr. Schumm's notes regarding Department of Justice contract.

Exhibit No. 32: State of Colorado Anticipated Field Data and Collection and Analysis, 1989 Field Season.


Exhibit No. 38: Sketch.
- Exhibit No. 39: Slides.
- Exhibit No. 40: Photograph of Goose Creek No. 4.
- Exhibit No. 41: Photograph of Middle Boulder Creek.
- Exhibit No. 42: Photograph of Middle Boulder Creek.
- Exhibit No. 43: Photograph of Middle Boulder Creek.
- Exhibit No. 44: Photograph of Little Beaver.
- Exhibit No. 45: Photograph of Little So. Fork of the Poudre.


542. Stanley A. Schumm. Transcript of tape made during 1986 helicopter flyover of Southern Colorado streams. (Transcript prepared by United States, June 1989.)


551. Gary Parker and Peter C. Klingeman, On Why Gravel Bed Streams are Paved, 18 Water Resources Research 1409-23 (October 1982).


555. Patricia L. Wiberg and J. Dungan Smith, Calculations of the Critical Shear Stress for Motion of Uniform and Heterogeneous Sediments, 23 Water Resources Research 1471-80 (August 1987).

556. Rolf Kellerhals, Stable Channels with Gravel-Paved Beds, 93 Journal of the Waterways and Harbors Division, Proceedings of the American Society of Civil Engineers 63-83 (1967).


559. Emory W. Lane, Design of Stable Channels, American Society of Civil Engineers, Transactions (Paper No. 2776).


566. Society of Paleontologists and Mineralogists, Glacial Sedimentary Environments (SEPM Short Course No. 16) (Gail M. Ashley, John Shaw, Norman D. Smith, eds. 1985).


570. Luna B. Leopold and M. Gordon Wolman, River Channel Pat-


582. D.E. Overton, Harl E. Judd, and C.W. Johnson, Optimizing Resistance Coefficients for Large Bed Element Streams (Utah
Hunter Rouse, H.J. Koloseus, and Jacob Davidian, The Role of the Froude Number in Open-Channel Resistance.


E.W. Lane, The Importance of Fluvial Morphology in Hydraz-
lic Engineering, 81 Proceedings of the American Society of Civil Engineers 745-1 to 745-17 (July 1955).

595. W.B. Langbein and S.A. Schumm, Yield of Sediment in Relation to Mean Annual Precipitation, 39 Transactions, American Geophysical Union 1076-84 (1958).


605. D.B. Simons, Chapter 20, River and Canal Morphology.

-6-


622. Richard F. Madole, Northern Great Plains (Colorado Piedmont Section), Chapter 10 in Decade of North American Geology.


625. Roger B. Colton, Glenn R. Scott, Jeffrey A. Holligan, and Larry W. Anderson, Preliminary Map of Landslide Deposits, Pueblo 1° X 2° Quadrangle, Colorado (Miscellaneous Field Studies Map MF-706 (1975)).

626. Roger B. Colton, Jeffrey A. Holligan, and Larry W. Anderson, Preliminary Map of Landslide Deposits, Denver 1° X 2° Quadrangle, Colorado (Miscellaneous Field Studies Map MF-705 (1975)).

627. Roger B. Colton, Jeffrey A. Holligan, Larry W. Anderson, and Penny E. Patterson, Preliminary Map of Landslide Deposits, Leadville 1° X 2° Quadrangle, Colorado (Miscellaneous Field Studies Map MF-701 (1975)).

628. Roger B. Colton, Jeffrey A. Holligan, and Larry W. Anderson, Preliminary Map of Landslide Deposits, Greeley 1° X 2° Quadrangle, Colorado (Miscellaneous Field Studies Map MF-704 (1975)).

629. Aerial Photographs of Water Division 1, copies produced by Richard F. Madole at his deposition on July 10, 1989.
630. Richard F. Madole, Surficial Geologic Map of the Craig 1/2° X 1° Quadrangle, Moffat and Routt Counties, Colorado (Miscellaneous Investigations Series Map I-1346 (1982)).

631. U.S.G.S. Map, East Portal Quadrangle, Colorado (7.5 minute series (topographic)).

632. U.S.G.S. Map, Isolation Peak, Colorado (7.5 minute series (topographic)).

633. U.S.G.S. Map, Monarch Lake, Colorado (7.5 minute series (topographic)).

634. U.S.G.S. Map, Allens Park Quadrangle, Colorado (7.5 minute series (topographic)).

635. U.S.G.S. Map, Ward Quadrangle, Colorado (7.5 minute series (topographic)).

636. U.S.G.S. Map, Nederland Quadrangle, Colorado (7.5 minute series (topographic)).

637. U.S.G.S. Map, Fairplay West Quadrangle, Colorado (7.5 minute series (topographic)).

638. U.S.G.S. Map, Climax Quadrangle, Colorado (7.5 minute series (topographic)).

639. U.S.G.S. Map, Mount Sherman Quadrangle, Colorado (7.5 minute series (topographic)).

640. U.S.G.S. Map, South Peak Quadrangle, Colorado (7.5 minute series (topographic)).

641. U.S.G.S. Map, Alma Quadrangle, Colorado (7.5 minute series (topographic)).

642. U.S.G.S. Map, Jones Hill Quadrangle (7.5 minute series (topographic)).


for the Systemwide/Site Specific (Two Forks) Environmental Impact Statement (June 1986).

647. Richard F. Madole. Map of Roosevelt National Forest, work copy, showing outlines of glacial features.


650. Luna B. Leopold, M. Gordon Wolman, and J.P. Miller, Weathering, Chapter 4, in Fluvial Processes in Geomorphology (1964).

651. Stanley A. Schumm. Transcript of Field Notes, 1986 Helicopter Flyover of Southern Colorado Streams. Halfmoon Creek, Lake Creek, Trout Creek, Browns Creek, Pass Creek, Poncha Creek, Elkhorn Creek, Big Dry Gulch, Saguache Creek, South Carnero Creek, Cotton Creek, Grape Creek, Bear Creek, Maes Creek, Mosca Creek, South Fork Rock Creek, Alamosa River, Lake Fork Creek, Bennett Creek, Beaver Creek, Wolf Creek, Turkey Creek, Devil Creek, Miller Creek, Coon Creek, Middle Mancos River, Cottonwood Creek, Morrison Creek, Cascade Creek, Bear Creek, Woodfern Creek, West Willow Creek, Tarryall Creek.

652. Stanley A. Schumm. Transcript of 1986 Field Notes: Bear Creek, Maes Creek, Kerr Creek, Browns Creek, Trout Creek, Tarryall Creek, South Fork of the South Platte River, North Tarryall Creek, Jefferson Creek, Wigwam Creek, Sand Creek, Laramie River, Little Beaver Creek, Middle St. Vrain Creek, South St. Vrain Creek, Fourmile Creek, South Fork of Chicago Creek.

653. Stanley A. Schumm. Transcript of 1988 Field Notes on St. Vrain Watershed: Left Hand Creek, James Creek, Spring Creek, Spring Gulch, Gold Hill Reservoir, Bell Creek, South St. Vrain Creek, Middle St. Vrain Creek.

654. Stanley A. Schumm. Transcript of 1989 Field Notes on Dave Rosgen's Detail Study Sites: Goose Creek, Middle Fork of Boulder Creek, Left Hand Creek, Lower Trap Creek, Upper Trap Creek, Poudre Pass Creek, Little Beaver Creek, Little South Fork of the Poudre.
655. SLA 1988 field work plans.
  - Schedule of SLA visits to quantification sites
  - Scope of work for SLA 1988 data collection program
  - Scope of work for Cedar Creek's vegetation data collection program
  - SLA proposed work plan for the geologic investigation
  - Record of Robert A. Mussetter's telephone conversation with Kerry Sundeen of Enartech, Inc., June 4, 1989

656. SLA, Calculation of roughness equations.
  - Listing of outliers omitted in SLA's reach-averaging procedure for characterizing channel resistance
  - Handwritten procedure showing preliminary hydraulic calculation procedure
  - SLA equations used to predict channel resistance
  - Miscellaneous SLA computer files created to describe channel resistance

  - Summary of bed-load data collected by SLA in 1986
  - Calculation of measured bed-load transport by size fraction for Little Beaver Creek, Saguache Creek, and Alamosa Creek
  - Documentation of preliminary applications of Meyer-Peter, Muller/Einstein equations to predict sediment-transport capacity (MS Ratio program)
  - Sample calculation of bed-load transport for Alamosa Creek
  - Data files for several quantification points, showing the cumulative distribution of particle sizes captured in the Helley-Smith sampler

658. SLA. Miscellaneous data base and input files.
  - Miscellaneous SLA computer files generated in estab-
lishing a data base in characterizing the hydraulics of study sites

659. SLA. Data from Chapter 30 references.
   - Presentation of drainage area, slope, and bed-material data from references sites in Chapter 30

660. SLA. Miscellaneous preliminary roughness calculations.
   - Preliminary outline for SLA report
   - Computer printout summarizing the statistical properties of the sigma (sigma=D84/D50) values for the study sites
   - Characterization of the study sites
   - Preliminary equations to predict channel resistance

661. SLA. Bed-material data.
   - Plots of the grain-size distribution of bed-material samples collected at the SLA study sites

662. SLA. Calculations: DARP-2, mean basin elevation.
   - Calculations of the mean basin elevation for the SLA study sites
   - Calculation of bankfull depth for input into DARP-2 program
   - Summary of bankfull cross-sectional geometry
   - Preliminary estimates of water-surface slopes
   - Location (latitude-longitude) of SLA study sites and applicable aerial photograph identification
   - Description of bank material for the SLA study sites
   - Summary of the representative bed-material distribution for the study sites
   - Documentation from the site selection process

663. SLA. Calculations.
   - Plots of calculated versus measured values of the
square root of $8/f$

- Comparison of 1.5-year return period discharge at various gage stations to the Forest Service-estimated bankfull discharge at the quantification points on the same streams
- Cross-sectional plots for Section 1, Little Beaver Creek and Section 5, North Crestone Creek
- Program documentation for SLA-developed probability paper-plotting program
- List of sites at which the Forest Service collected sediment data

664. SLA. Additional miscellaneous analyses

- Plots comparing the application of the Parker and Meyer-Peter, Muller equations
- Sheet containing comparison of two different bed layer thicknesses, input to Meyer-Peter, Muller equation
- Enlarged copies of cross section sketches from SLA field notebooks
- Cross section plots for various SLA cross sections and sites
- Letter from AGO to Robert Trout, NCWCD, regarding Forest Service field sites
- SLA data summary from 1986 field work
- Comparison of measured versus calculated cross-sectional geometry value at bankfull
- Table of Forest Service Water Division 1 base stations
- Listing of the number of quantification points in Water Division 1 with calculated versus measured bankfull topwidth
- Longitudinal stream profiles for various SLA data collection sites
- Estimate of impact of 100-year floods on various SLA
data collection sites
- Listing of SLA data files in computer subdirectory
- Copies of field notes from Mike Harvey
- List of Enartech, Inc. field visits within Division 3
- List of SLA data collection sites with divided flow
- Plot of bed-load measurements
- Analyses of relationships between channel slope and other variables
- Printout of hydrograph volumes for various sites
- Documentation from SLA geologic investigation
- Summary printout showing the percentage of SLA data sites with D84, D50, and D16 in various particle size ranges
- Single page from SLA letter to Bob Hykan, AGO, June 16, 1986
- Summary page of dates at which field visits were made to each of the 1988 SLA data sites
- Sediment grade scale table
- Illustrative sketch depicting the effect of grain-size sorting on resistance
- Outline and tables from February 2, 1987, progress review meeting

665. SLA. 1986 field work documentation.
- List of field equipment
- Letter from SLA to Bob Hykan, AGO, June 24, 1986
- Letter from SLA to Bob Hykan, AGO, June 2, 1986
- Letter from Enartech, Inc. to Bob Mussetter, SLA, June 2, 1986
- Letter from SLA to Bob Hykan, AGO, May 2, 1986
Sample SLA field data sheets (2)

Copies of Simons and Associates, Inc. summary report to Denver Water Department

Documentation of preliminary SLA work in selecting sites for study in 1986

SLA notes from early discovery of Forest Service data

Notes by Bob Musseter, SLA, taken during meeting with Steve Viert and Mike Harvey, November 11, 1988

Agenda for August 29, 1986, progress review meeting

Notes regarding State's water rights data base

Agenda for February 2, 1987, progress review meeting

Agenda for December 17, 1986, progress review meeting

666. SLA. Forest Service Methods.

Documentation by SLA on the methodologies used by the Forest Service in Water Division 1 and 3 to quantify instream flow claims

667. SLA. Preliminary tables, charts and plots.

Miscellaneous preliminary illustrations generated by SLA in preparing its report

668. SLA. Plots from 1988 bed-material data.

Representative bed-material plots generated by SLA from 1986 and 1988 field visits to the SLA data collection sites

669. SLA. Qualitative descriptions of study sites

Qualitative descriptions made by SLA of each of 49 sites visited in 1986

AG Alpha No. LW FR HRDJ
AG File No. CNR8904035/PK

-9-


- SLA Field Manual
  - Deposition Volume I, April 10, 1989
  - Deposition Volume II, April 11, 1989
  - Deposition Volume III, April 12, 1989
  - Deposition Volume IV, April 13, 1989
  - Deposition Volume V, April 14, 1989
  - Deposition Volume VI, April 17, 1989
  - Deposition Volume VII, April 18, 1989
  - Deposition Volume VIII, April 19, 1989
  - Deposition Volume IX, April 20, 1989
  - Deposition Volume X, April 21, 1989


- Exhibit No. 1: Resume of Tracy B. Vermeyen
- Exhibit No. 2: Resume of Kenton J. Bruxvoort
- Exhibit No. 3: Resume of Kathleen E. Cohan
- Exhibit No. 4: Resume of Leslie Coleman Stillwater
- Exhibit No. 5: Field data collection procedures (revisits)
- Exhibit No. 6: Computer printouts of various cross-sectional geometry
- Exhibit No. 7: Plots of surveyed cross sections for South St. Vrain Creek
- Exhibit No. 8: Miscellaneous summaries of hydraulic calculations
- Exhibit No. 9: Computer printouts of cross-sectional data
- Exhibit No. 10: Fortran programs
- Exhibit No. 11: South St. Vrain Creek summary file
- Exhibit No. 11A: South St. Vrain Creek 1988 field notes
- Exhibit No. 12: South St. Vrain Creek 1986 field notes
- Exhibit No. 13: Middle St. Vrain Creek 1986 field notes
- Exhibit No. 14: Middle St. Vrain Creek summary notes
- Exhibit No. 15: Middle St. Vrain Creek 1988 field notes
- Exhibit No. 16: Little Beaver Creek 1986 field notes
- Exhibit No. 17: Little Beaver Creek summary file
- Exhibit No. 18: Little Beaver Creek 1988 field notes
- Exhibit No. 19: North Tarryall Creek 1986 field notes
- Exhibit No. 20: North Tarryall Creek 1988 field notes
- Exhibit No. 21: North Tarryall Creek summary file
- Exhibit No. 22: Jefferson Creek 1988 field notes
- Exhibit No. 23: Jefferson Creek summary file
- Exhibit No. 24: Jefferson Creek 1986 field notes
- Exhibit No. 25: Alamosa Creek summary file
- Exhibit No. 26: Alamosa Creek 1988 field notes
- Exhibit No. 27: Alamosa Creek 1986 field notes
Exhibit No. 28: North Crestone Creek summary file
Exhibit No. 29: North Crestone Creek 1986 and 1988 field notes
Exhibit No. 30: Saguache Creek 1988 field notes
Exhibit No. 31: Saguache Creek summary file
Exhibit No. 32: Saguache Creek 1986 field notes
Exhibit No. 33: Cotton Creek 1988 field notes
Exhibit No. 34: Cotton Creek summary file
Exhibit No. 35: Cotton Creek 1986 field notes
Exhibit No. 36: Mosca Creek 1986 field notes
Exhibit No. 37: Mosca Creek summary file
Exhibit No. 38: Fourmile Creek summary file
Exhibit No. 39: Fourmile Creek 1986 field notes
Exhibit No. 40: Laramie River summary file
Exhibit No. 41: Fish Creek 1986 field notes
Exhibit No. 42: Fish Creek summary file
Exhibit No. 43: Laramie River 1986 field notes
Exhibit No. 44: Sand Creek 1986 and 1988 field notes
Exhibit No. 45: Sand Creek summary file
Exhibit No. 46: Wigwam Creek summary file
Exhibit No. 47: Wigwam Creek 1986 field notes
Exhibit No. 48: Payne Gulch 1986 field notes
Exhibit No. 49: Payne Gulch summary file
Exhibit No. 50: Deer Creek 1986 field notes
Exhibit No. 51: Deer Creek summary file
Exhibit No. 52: South Fork of South Platte 1986 and 1988 field notes

Exhibit No. 53: South Fork of South Platte summary file

Exhibit No. 54: South Chicago Creek 1986 field notes

Exhibit No. 55: South Fork Chicago Creek summary file

Exhibit No. 56: Fall River 1986 field notes

Exhibit No. 57: Fall River summary file

Exhibit No. 58: Lake Fork Creek 1986 field notes

Exhibit No. 59: Lake Fork Creek summary file

Exhibit No. 60: South Fork Rock Creek 1986 field notes

Exhibit No. 61: South Fork Rock Creek summary file

Exhibit No. 62: Bennett Creek, 29D, summary file

Exhibit No. 63: Bennett Creek, 29D, 1986 and 1988 field notes

Exhibit No. 64: Beaver Creek 1986 field notes

Exhibit No. 65: Beaver Creek summary file

Exhibit No. 66: Woodfern Creek summary file

Exhibit No. 67: Woodfern Creek 1986 field notes

Exhibit No. 68: Bennett Creek, 39F1, 1986 field notes

Exhibit No. 69: Bennett Creek, 39F1, summary file

Exhibit No. 70: West Willow Creek summary file

Exhibit No. 71: West Willow Creek 1986 field notes

Exhibit No. 72: South Canero Creek summary file

Exhibit No. 73: South Canero Creek 1986 and 1988 field notes

Exhibit No. 74: Elkhorn Gulch 1986 field notes
- Exhibit No. 75: Elkhorn Gulch summary file
- Exhibit No. 76: Roaring Creek 1988 field notes
- Exhibit No. 77: Roaring Creek summary file
- Exhibit No. 78: Alder Creek 1988 field notes
- Exhibit No. 79: Little Beaver Creek Gage 1988 field notes
- Exhibit No. 80: Jefferson Creek Gage 1988 field notes
- Exhibit No. 81: Kerber Creek Gage 1988 field notes
- Exhibit No. 82: Pinos Creek Gage 1988 field notes
- Exhibit No. 83: Goose Creek Gage 1988 field notes
- Exhibit No. 84: Cross section plots for Alamosa River
- Exhibit No. 85: Cross section plots for the remaining 1986 study sites (North Tarryall Creek, North Crestone Creek, Halfmoon Creek, Little Beaver Creek, Mosca Creek, Jefferson Creek, Middle St. Vrain Creek, Saguache Creek, Cotton Creek, Poncha Creek, Grape Creek, Mae's Creek, Bear Creek, Pass Creek, Stout Creek, Brown's Creek, Trout Creek, Fourmile Creek, Fish Creek, Laramie River, Sand Creek, Wigwam Creek, Payne Gulch, Deer Creek, South Fork of the South Platte River, South Fork Chicago Creek, Fall River, Lake Fork Creek, South Fork Rock Creek, Bennett Creek, Beaver Creek, Woodfern Creek, West Willow Creek, South Carnero Creek, Big Dry Gulch, Elkhorn Gulch, Wolf Creek, Devil Creek, Miller Creek, Cascade Creek, Coon Creek, Bear Creek, Morrison Creek, Turkey Creek, Cottonwood Creek, Middle Mancos River.
- Exhibit No. 86: Geologic Field Book of Kathleen Cohan
- Exhibit No. 87: Profile plots from geologic investigation
- Exhibit No. 88: Geology file of Kathleen Cohan
- Exhibit No. 89: Literature review of Kathleen Cohan (notes; maps of major geologic features; Gerald M. Richmond, Quaternary Stratigraphy of the Durango Area, San Juan Mountains, Colorado, U.S.G.S. Professional Paper 525-C (1965); M. Gordon Wolman and John P. Miller, Magnitude and Frequency of Forces in Geomorphic Processes (1959); R. R. Curry, Observation of Alpine Mudflows in the Tenmile Range, Central Colorado, 77 Geological Society of America Bulletin 771-76 (July 1966); John E. Costa and

- Exhibit No. 90: Photograph, South St. Vrain Creek, Section 2
- Exhibit No. 91: Schematic sketch of cross section
- Exhibit No. 92: Photograph, South St. Vrain Creek, bar upstream
- Exhibit No. 93: Photograph, South St. Vrain Creek, cobbles downstream
- Exhibit No. 94: Photograph, South St. Vrain Creek, pool near Section 2
- Exhibit No. 95: Photograph, South St. Vrain Creek, Wolman pebble count location
- Exhibit No. 96: Grain-size distribution curve, South St. Vrain Creek, right bank
- Exhibit No. 97: Grain-size distribution curve, South St. Vrain Creek, left bank
- Exhibit No. 98: Wolman pebble count notes from South St. Vrain Creek field notebook
- Exhibit No. 99: Interrogatory answers relating to Robert A. Mussetter
- Exhibit No. 100: Laboratory sieve analysis results
- Exhibit No. 101: Grain-size analysis-mechanical
- Exhibit No. 102: Stream classification ("characterization") file
- Exhibit No. 103: Analysis procedures to examine stream stability
- Exhibit No. 104: Comparison of others' data file
- Exhibit No. 105: Diversion information
- Exhibit No. 106: Development of resistance equations file
- Exhibit No. 112: SLA, Agenda for first project meeting with Colorado Department of Law, meeting 04/29/86
- Exhibit No. 113: SLA, Letter from Robert A. Mussetter to AGO re preliminary analysis of U.S. claims and recommended sites for initial data collection program. May 2, 1986.
- Exhibit No. 114: SLA, Letter from Robert A. Mussetter to AGO re revisions to site list recommended for initial data collection program. May 12, 1986.
Exhibit No. 117: Enartech, Inc., Letter to SLA re difficulty in maintaining consistency in the selection of study reaches and crosssections for Lake Fork Creek, Elkhorn Gulch, West Willow Creek, Bennett Creek, Morrison Creek, Middle Mancos River, Coon Creek, and Bear Creek. July 9, 1986.


Exhibit No. 121: SLA, National Forest Stream Studies, progress review meeting materials, 02/02/87.

Exhibit No. 122: Sketch illustrating the impact of nonuniformity in the size of bed material on channel resistance.


Exhibit No. 126: Maes Creek summary file.

Exhibit No. 127: Maes Creek 1988 field notes.

Exhibit No. 128: Maes Creek 1986 field notes.

Exhibit No. 129: Cascade Creek 1986 field notes.

Exhibit No. 130: Cascade Creek summary file.

Exhibit No. 131: Preliminary set of calculations by Robert A. Mussetter.
Exhibit No. 132: Computer printouts (104793-104859)

Exhibit No. 133: Computer printouts (104860-104885)

Exhibit No. 134: Computer printouts (104886-105011)

Exhibit No. 135: Flow chart (Michael D. Harvey's Channel Analysis)

Exhibit No. 136: Computer printouts (104707-104715)

Exhibit No. 137: Computer printouts (104728-107733)

Exhibit No. 138: Histogram notes (104738-104740)

Exhibit No. 139: CWCB St. Vrain watershed instream flow appropriations (104784-104886)

Exhibit No. 140: Notes of Robert A. Mussetter from Field visit with Stanley A. Schumm, Michael D. Harvey, and Richard F. Harner (1986).

Exhibit No. 141: Bed-material transport investigations file

Exhibit No. 142: Output file from published data

Exhibit No. 143: Simons and Associates, Inc. Preliminary Comments and Questions on Vegetation Encroachment Analysis

Exhibit No. 144: Cedar Creek. Notes, Channel Maintenance Flow With Respect to Vegetation Encroachment.


Exhibit No. 146: Pages 100205 through 100217, calculations

Exhibit No. 147: Pages 100218 through 100225, calculations

Exhibit No. 148: Page 100226, observations regarding Chapter 30 methodology (hand-written notes).

Exhibit No. 149: Comments regarding bankfull discharge estimates, Kent Bruxvoort

Exhibit No. 150: Pages 100232 through 100236, calculations
Exhibit No. 151: Pages 100237 through 100257, calculations

Exhibit No. 152: Pages 100258 through 100282, calculations

Exhibit No. 153: Pages 100283 through 100288, calculations

Exhibit No. 154: Pages 100289 through 100292, calculations

Exhibit No. 155: Pages 100310 through 100315, calculations


Exhibit No. 157: Photograph provided by United States

Exhibit No. 158: Summary of information relating to SLA study sites (100316-100317)

Exhibit No. 159: Summary of analysis re: standard error associated with various cross-sectional geometry relationships (100334-100336)

Exhibit No. 160: Individual data points used to develop numbers in Exhibit No. 159 (100332-100333)

Exhibit No. 161: Tabulation of depth discharge and width direction curves (100337-100346)

Exhibit No. 162: Evaluation of the flow-duration curves (100347-100362)

Exhibit No. 163: Summary of preliminary incipient motion calculations at bankfull hydraulic conditions (100375-100376)

Exhibit No. 164: Preliminary summary table relating to various hydraulic parameters (100377-100378)

Exhibit No. 165: Preliminary table summarizing SLA's estimate of bankfull discharge versus Forest Service's estimate of bankfull discharge (100379)

Exhibit No. 166: Summary of maximum discharge in the mean annual hydrograph developed by Forest Service (100380)

Exhibit No. 167: Preliminary calculations of hydrograph required to transport sediment supply at Saguache Creek site (100381-100386)
Exhibit No. 168: Calculations (100387-100397)

Exhibit No. 169: Calculations, notes (100410-100430)

Exhibit No. 170: Bed-material plots, notes (101380-101446)

Exhibit No. 171: Sieve analysis data sheets (101510-101708)

Exhibit No. 172: Photograph from helicopter, Little Beaver Creek

Exhibit No. 173: Photograph from helicopter, Laramie River

Exhibit No. 174: Photograph from helicopter, North Tarryall Creek

Exhibit No. 175: Photograph from helicopter, Wigwam Creek

Exhibit No. 176: Photograph from helicopter, Middle St. Vrain Creek

Exhibit No. 177: Photograph from helicopter, South St. Vrain Creek

Exhibit No. 178: Photograph from helicopter, unidentified

Exhibit No. 179: Photograph from helicopter, unidentified

Exhibit No. 180: Photograph from helicopter, unidentified

Exhibit No. 181: Photograph from helicopter, unidentified

Exhibit No. 182: Photograph from helicopter, unidentified

Exhibit No. 183: Photograph from helicopter, South Chicago Creek

Exhibit No. 184: Photograph from helicopter, North Tarryall Creek

Exhibit No. 185: Photograph from helicopter, unidentified

Exhibit No. 186: Photograph from helicopter, unidentified

Exhibit No. 187: Photograph from helicopter, Wigwam Creek

Exhibit No. 188: Photograph from helicopter, Wigwam Creek

-11-
- Exhibit No. 189: Photograph from helicopter, North Tarryall Creek

- Exhibit No. 190: Photograph from helicopter, North Tarryall Creek

- Exhibit No. 191: Photograph from helicopter, North Tarryall Creek
DISCOVERY MATERIALS -- INDEX NO. 17


672. Forest Service. 1989 Above-Below Channel Geometry Project.


681. Forest Service. South Platte Stats, Trans to lgt.


683. State of Colorado and NCWCD. Joint Notice of Cancellation


- Two Forks Reservoir on the South Platte River.


- Answers by Gary L. Lewis, Casey S. Funk, Jack F. Ross, Jim Sanderson, and Steven A. Schmitzer.


- Answers by Casey S. Funk.

- Attachments: Resume of Steven T. Dougherty, ERO Resources Corp.; Denver's Contract with ERO Resources Corp; Proposal for Litigation Support


692. Denver. Letter dated June 18, 1986 to David Little, Water -2-


701. Denver. List of publications reviewed by Gary L. Lewis.


• Serge Leliavsky, *An Introduction to Fluvial Hydraulics*.

• Walter Hans Graf, *Hydraulics of Sediment Transport*.

• ASCE Task Committee for the Preparation of the Manual on Sedimentation of the Sedimentation Committee of the Hydraulics Division, *Sedimentation Engineering*.


• Keith Richards, *Rivers: Form and Process in Alluvial Channels*.


• F.M. Henderson, *Open Channel Flow*.


• Luna B. Leopold, M. Gordon Wolman, and John P. Miller, *Fluvial Processes in Geomorphology*.

• Background to Paleohydrology: A Perspective (K.J. Gregory, ed.).


• Johannes Gessler, Beginning and Ceasing of Sediment Motion (Preliminary draft of paper presented at the Institute of River Mechanics held at Colorado State University June 15-26, 1970).


Task Force on Nomenclature for Hydraulics of the Committee on Hydraulic Structures of the Hydraulics Division of the American Society of Civil Engineers, Nomenclature for Hydraulics.

American Society of Civil Engineers, Index to Transactions, Volumes I to LXXXIII 1867 to 1920 (1921).

American Society of Civil Engineers, Index to Transactions, Volumes 84 to 99: 1921 to 1934 (1934).


Colorado Water Resources Research Institute, List of Publications.


Kenneth L. Wahl, Relating Streamflow Characteristics
to Channel Cross-Section Properties -- A Literature Review (March 1974).

- Elon Huntington Hooker, The Suspension of Solids in Flowing Water, 36 American Society of Civil Engineers Transactions 239 (1896).


- Engineering Considerations in Small Stream Management, 22 Water Resources Bulletin (William L. Jackson, ed.).


- Bibliography pertaining to the Platte River.

- Forest Service, Chapter 30 (September 10, 1985).
- Gary L. Lewis Publications List.
- U.S. Army Corps of Engineers, the Hydrologic Engineering Center, Publications Catalog (August 1987).
- University of Nebraska, Institute of Agriculture and Natural Resources, Conservation and Survey Division, Publications (August 1987).
- U.S. Army Engineer Waterways Experiment Station. Special Projects Branch Technical Information Center, List of Publications of the U.S. Army Engineer Waterways Experiment Station. (July 1977).

- Clear Creek Upper Main Stem, quantification point 37 D 2.
- West Fork Clear Creek, quantification point 37 G 1.


726. NCWCD. Correspondence with St. Vrain and Left Hand Water Conservancy District re computer printouts of water rights. May 12 and 17, 1988. (NCWCD PR).

   ° Lone Pine Creek, quantification point 65 B 2.


736. David W. Hubbell, Bed Load Sampling and Analysis (undated paper). (NCWCD PR)


743. Charles F. Leaf, Sediment Yields from High Mountain Watersheds, Central Colorado (U.S. Forest Service Research Paper RM-23 (1966)).


753. Colin R. Thorne and N. Keith Tovey, Discussion of Victor Miguel Ponce, Generalized Stability Analysis of Channel Banks, Discussion by Luis Carballada (December 1979). (NCWCD PR).


-12-
761. Norman I. Wengert, A Review and Re-Examination of the "Purposes" of the National Forests as these were Formulated, Articulated, and Understood in the Three Decades from about 1880 to 1910 -- A Summary and Reconnaissance Providing the Basis for Subsequent Analysis. (First report November 21, 1988). (NCWCD PR).


770. NCWCD. Quad sheets. (NCWCD PR).

771. NCWCD. Decrees and documents relating to the water rights held by the Northern Colorado Water Conservancy District (compiled by Davis, Graham & Stubbs, September 1985). (NCWCD PR).

772. NCWCD. Water rights decrees: Colorado Big Thompson Project, North Poudre Supply Canal, and Horsetooth Reservoir. (NCWCD PR).


774. NCWCD. Field Notes and Photographs: Corral Creek, Lone Pine Tree Creek, Unnamed tributary to South Lone Pine Tree Creek, Young Gulch, Trap Creek, McIntyre Creek, South Fork St. Vrain Creek, West Fork of Little Thompson River, Elk-horn Creek, Lefthand Creek, South Fork Cache La Poudre River, North Fork Boulder Creek. 1988. (NCWCD PR).

775. E.V. Richardson. Fieldbook: Gordon Creek, Young Gulch, Skin Gulch, Poverty Gulch, confluence Elkhorn Creek and Poudre River, South Fork Cache La Poudre River, Bennett Creek, Unnamed tributary to Cache La Poudre River, Dadd Gulch, Roaring Creek, Peterson Creek, Little Beaver Creek, Trap Creek, Joe Wright Creek, West Fork of the Laramie River, Laramie River, Brinker Creek, Stub Creek, Jinks Creek, McIntyre Creek, Pine Creek, Stuart Creek, British Creek, La Garde Creek, McGuire Creek, Lone Pine Creek, Unnamed tributary to South Fork Lone Pine Creek, Manhattan Creek. 1988. (NCWCD PR).

776. NCWCD. Cross-sections: North Fork Middle Boulder Creek, South Fork St. Vrain Creek, Lefthand Creek, West Fork Little Thompson Creek, Corral Creek, Trap Creek, South Fork Cache La Poudre River, Stove Prairie and Young Gulch, Elk-horn Creek, Lone Pine Creek, McIntyre Creek. 1988. (NCWCD PR).