DACUM Research Chart for
Class II Collection System Operator

DACUM Panel

Mike Foster
Tech Support Manager
City of Columbus
Columbus, OH

David R. Ickes
Maintenance Specialist
City of Reynoldsburg
Reynoldsburg, OH

Matt Pennington
Collection System Supervisor
Southwest Licking Water & Sewer
Hebron, OH

Michael Root
Project Manager/Certified
Operator
EMH&T
Columbus, OH

Norman Sigel
Sanitary Collection/Storm Water
Supervisor
City of Washington Court House
Washington Court House, OH

DACUM Facilitators

Dave Bornino
Carl Sofranko
Jon VanDommelen
Robert E. Norton, Team Leader

Sponsored by

Ohio EPA

Produced by

Ohio State University
Center on Education and Training for Employment
College of Education and Human Ecology

June 14-15, 2007
### DACUM Research Chart for Class II Collection System Operator

#### Perform Support Equipment Maintenance
- **A-1** Inspect PPE for worthiness
- **A-2** Conduct pre-trip vehicle inspection
- **A-3** Conduct tool & equipment inspections
- **A-4** Maintain spare parts inventory
- **A-5** Replace worn/broken parts

#### Perform Collection System Maintenance
- **B-1** Maintain odor control system
- **B-2** Implement PM program
- **B-3** Inspect manholes
- **B-4** Raise manhole to grade
- **B-5** Clean sewers (e.g., storm, sanitary)
- **B-13** Schedule cleaning for problem areas
- **B-14** Maintain sluice gates
- **B-15** Maintain flap gates
- **B-16** Clean force mains with pig
- **B-17** Inspect storm water BMP’s

#### Perform Collection System Repairs
- **C-1a** Seal manholes (e.g., boots, barrels, chimneys)
- **C-1b** Coat manholes with sealer
- **C-1c** Reconstruct manholes
- **C-1d** Clean pump station screens
- **C-3c** Repair force mains
- **C-3d** Maintain air relief valves
- **C-3e** Maintain SCADA system
- **C-3f** Maintain force mains
- **C-3g** Maintain SCADA system

#### Conduct Sewer System Analysis
- **D-1a** Install stalling poles
- **D-1b** Conduct flow isolation
- **D-1c** Install chalk & block
- **D-4** Conduct smoke test
- **D-5** Conduct dye test
- **D-6** Conduct CCTV inspection
- **D-7** Review CCTV video/logs
- **D-8** Conduct sample analysis

#### Prepare Reports and Documentation
- **E-1** Prepare SOP
- **E-2** Develop reporting forms
- **E-3** Complete work orders
- **E-4** Complete complaint records
- **E-5** Complete daily logs
- **E-13** Complete police officer permit
- **E-14** Complete street occupancy permit
- **E-15** Complete fire hydrant permits
- **E-16** Complete daily work reports
- **E-17** Complete pretreatment reports
- **E-25** Complete mileage reports
- **E-26** Complete SSES reports
- **E-27** Complete tap records
- **E-28** Complete inspection report for new installation
- **E-35** Prepare quarterly CSO reports
- **E-36** Gather performance data
- **E-37** Analyze performance data
- **E-38** Complete dam EPA
- **E-39** Complete dam inspection report

#### Manage Personnel
- **F-1** Assign daily tasks to employees
- **F-2** Assign materials & equipment to employees (e.g., keys, tools, vehicles, PPE)
- **F-3** Supervise collection system personnel
- **F-4** Verify employee timesheets
<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A-6</td>
<td>Maintain equipment maintenance logs</td>
<td>A-7</td>
<td>Report equipment malfunctions</td>
<td>A-8</td>
<td>Download software updates</td>
</tr>
<tr>
<td>B-6</td>
<td>Clean pump station wet well</td>
<td>B-7</td>
<td>Conduct CCTV inspection of sewers</td>
<td>B-8</td>
<td>Remove intruding roots from sewer</td>
</tr>
<tr>
<td>B-9</td>
<td>Implement FOG program</td>
<td>B-10</td>
<td>Update PM program</td>
<td>B-11</td>
<td>Inspect catch basins</td>
</tr>
<tr>
<td>B-12</td>
<td>Clean catch basins</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-18</td>
<td>Maintain storm water BMP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-2a</td>
<td>Install point repairs (e.g., linear, grouting, replace pipe)</td>
<td>C-2b</td>
<td>Repair broken laterals</td>
<td>C-2c</td>
<td>Remove protruding taps</td>
</tr>
<tr>
<td>C-3</td>
<td>Maintain pump stations (sub-duty)</td>
<td>C-3a</td>
<td>Repair/replace grinders</td>
<td>C-3b</td>
<td>Repair/replace pumps</td>
</tr>
<tr>
<td>C-3c</td>
<td>Repair/replace valves (e.g., check, gate)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-5</td>
<td>Repair/replace/install headwalls</td>
<td>C-6</td>
<td>Repair/replace/install flap gates</td>
<td>C-7</td>
<td>Repair/replace install sluice gates</td>
</tr>
<tr>
<td>C-8</td>
<td>Repair catch basins</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-1e</td>
<td>Collect flow data</td>
<td>D-1f</td>
<td>Scrub flow data</td>
<td>D-2</td>
<td>Evaluate pump station performance (sub-duty)</td>
</tr>
<tr>
<td>D-2a</td>
<td>Perform pump pressure test</td>
<td>D-2b</td>
<td>Analyze SCADA data</td>
<td>D-2c</td>
<td>Analyze pump station operating records</td>
</tr>
<tr>
<td>D-3</td>
<td>Perform GPS manhole locations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-9</td>
<td>Conduct atmospheric testing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-10</td>
<td>Maintain collection system maps</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-11</td>
<td>Conduct residential/commercial sanitary inspections</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-12</td>
<td>Perform mandrel, vacuum, air test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-6</td>
<td>Complete sanitary system cleaning reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-7</td>
<td>Complete PM cleaning forms</td>
<td>E-8</td>
<td>Complete manhole rehabilitation forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-9</td>
<td>Complete CCTV log</td>
<td>E-10</td>
<td>Complete pump station O&amp;M report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-11</td>
<td>Complete call-out log</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-12</td>
<td>Complete confined space permit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-18</td>
<td>Complete I/I reports</td>
<td>E-19</td>
<td>Complete pump station start-up reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-20</td>
<td>Complete FOG program reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-21</td>
<td>Complete state pump station reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-22</td>
<td>Complete generator reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-23</td>
<td>Complete public notification reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-24</td>
<td>Complete NPDES reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-29</td>
<td>Complete inspection report for repairs</td>
<td>E-30</td>
<td>Prepare spill notification report (e.g., EPA, phone, 5-day, Health/Water Dept.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-31</td>
<td>Prepare monthly SSO reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-32</td>
<td>Prepare SSO/WIB reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-33</td>
<td>Prepare annual floodwall implementation reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-34</td>
<td>Complete floodwall inspection forms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-5</td>
<td>Approve employee leave requests</td>
<td>F-6</td>
<td>Conduct employee performance reviews</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-7</td>
<td>Initiate employee disciplinary actions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-8</td>
<td>Mediate employee dispute resolution</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-9</td>
<td>Identify employee training requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-10</td>
<td>Identify employee safety requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-11</td>
<td>Conduct personnel interviews</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

June 14-15, 2007
## DACUM Research Chart for Class II Collection System Operator

### Duties

<table>
<thead>
<tr>
<th>G</th>
<th>Manage Collection System Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>G-1</td>
<td>Manage capital improvement projects</td>
</tr>
<tr>
<td>G-2</td>
<td>Manage renovation projects</td>
</tr>
<tr>
<td>G-3</td>
<td>Manage abandoned sewer projects</td>
</tr>
<tr>
<td>G-4</td>
<td>Manage I/I removal projects</td>
</tr>
<tr>
<td>G-5</td>
<td>Manage relocation projects</td>
</tr>
<tr>
<td>G-13</td>
<td>Perform final walk through</td>
</tr>
<tr>
<td>G-14</td>
<td>Develop punch list</td>
</tr>
<tr>
<td>G-15</td>
<td>Initiate project acceptance</td>
</tr>
<tr>
<td>G-16</td>
<td>Manage construction of sewer extension projects</td>
</tr>
</tbody>
</table>

### Tasks

<table>
<thead>
<tr>
<th>H</th>
<th>Provide Customer Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-1</td>
<td>Investigate customer complaints</td>
</tr>
<tr>
<td>H-2</td>
<td>Perform customer complaint follow up</td>
</tr>
<tr>
<td>H-3</td>
<td>Perform utility locates</td>
</tr>
<tr>
<td>H-4</td>
<td>Perform repair inspection</td>
</tr>
<tr>
<td>H-5</td>
<td>Perform new service installation inspection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I</th>
<th>Provide for Employee &amp; Self Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-1</td>
<td>Conduct self evaluation</td>
</tr>
<tr>
<td>I-2</td>
<td>Attend safety training</td>
</tr>
<tr>
<td>I-3</td>
<td>Attend construction training</td>
</tr>
<tr>
<td>I-4</td>
<td>Attend required workplace training</td>
</tr>
<tr>
<td>I-5</td>
<td>Attend workshops/seminars</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>J</th>
<th>Manage Financial Matters</th>
</tr>
</thead>
<tbody>
<tr>
<td>J-1</td>
<td>Track expenditures</td>
</tr>
<tr>
<td>J-2</td>
<td>Prepare budgets</td>
</tr>
<tr>
<td>J-3</td>
<td>Prepare contracts</td>
</tr>
<tr>
<td>J-4</td>
<td>Track contracts</td>
</tr>
<tr>
<td>J-5</td>
<td>Prepare proposals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K</th>
<th>Implement Floodwall Operation Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-1</td>
<td>Monitor river elevation</td>
</tr>
<tr>
<td>K-2</td>
<td>Notify emergency agencies (e.g., police, EPA)</td>
</tr>
<tr>
<td>K-3</td>
<td>Notify government agencies</td>
</tr>
<tr>
<td>K-4</td>
<td>Coordinate emergency agency response</td>
</tr>
<tr>
<td>K-5</td>
<td>Call emergency workforce &amp; volunteers</td>
</tr>
</tbody>
</table>

**Note:** Although panelists are certified Class II Collection System Operators, all members of the panel do not perform every task on this chart.

### Acronyms

- AC: Army Corps of Engineers
- OE: Army Corps of Engineers
- BMP: Best Management Plan
- CCTV: Closed Circuit Television
- CDL: Commercial Driver’s License
- CMOM: Capacity Management Operation and Maintenance
- CSO: Combined Sewer Overflow
- EAP: Emergency Action Plan
- EMA: Emergency Management Agency
- EPA: Environmental Protection Agency
- EPM: Essential Preventative Maintenance
- FOG: Fats, Oils, and Grease
- GPS: Global Positioning System
- I/I: Inflow and Infiltration
- LTCP: Long Term Control Plan
- NPDES: National Pollution Discharge Elimination System
- O&M: Operation & Maintenance
- OUPS: Ohio Utility Protection Service
- PM: Preventative Maintenance
- PPE: Personal Protection Equipment
- R/R: Repair/Replace
- SCADA: Supervisory Control and Data Acquisition
- SOP: Standard Operating Procedures
- SSES: Sanitary Sewer Evaluation Study
- SSO: Sanitary Sewer Overflow
- WIB/SIB: Water in Basement/Sewage in Basement
<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>G-6</td>
<td>Review draft plans &amp; specifications</td>
<td>G-7</td>
<td>Attend preconstruction meetings</td>
<td>G-8</td>
<td>Review fees, budget, associated reports</td>
<td>G-9</td>
</tr>
<tr>
<td>G-10</td>
<td>Attend team meetings</td>
<td>G-11</td>
<td>Advise supervisor of project progress</td>
<td>G-12</td>
<td>Interpret plans &amp; specifications</td>
<td></td>
</tr>
<tr>
<td>H-6</td>
<td>Provide installation specifications</td>
<td>H-7</td>
<td>Provide installation fee schedule</td>
<td>H-8</td>
<td>Provide change of ownership inspection</td>
<td>H-9</td>
</tr>
<tr>
<td>H-10</td>
<td>Provide complaint history</td>
<td>H-11</td>
<td>Promote dry basement program</td>
<td>H-12</td>
<td>Provide basement clean up</td>
<td></td>
</tr>
<tr>
<td>I-6</td>
<td>Track contact hours</td>
<td>I-7</td>
<td>Provide on-the-job training</td>
<td>I-8</td>
<td>Obtain on-the-job training</td>
<td>I-9</td>
</tr>
<tr>
<td>I-10</td>
<td>Review technical literature (e.g., trade journals, magazines, web)</td>
<td>I-11</td>
<td>Mentor employees</td>
<td>I-12</td>
<td>Network with peers</td>
<td></td>
</tr>
<tr>
<td>J-6</td>
<td>Review proposals</td>
<td>J-7</td>
<td>Track material usage</td>
<td>J-8</td>
<td>Prepare emergency fund request</td>
<td>J-9</td>
</tr>
<tr>
<td>K-6</td>
<td>Coordinate emergency operation plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
General Knowledge and Skills

- Read detailed plans and blueprints
- Computer skills
- Communication skills
- Basic mechanics
- Basic skills
- Electrical skills
- Time management skills
- Project management skills
- Plumbing skills
- Record retention
- Environmental regulations
- Problem solving skills
- Math skills
- Equipment operation
- Writing skills
- Excavation skills
- Basic chemistry
- Problem solving skills

Worker Behaviors

- Ability to work in adverse weather/conditions
- Team player
- Thick skinned
- Patient
- Considerate
- Able to multi-task
- Adaptable
- Flexible
- Punctual
- Able to be confidential
- Good decision maker
- Confident
- Competent
- Self starter
- Ability to complete task
- Service oriented
- Sense of humor

Tools, Equipment, Supplies and Materials

Hand tools
PC, laptops, software
Cameras
Phones
Heavy equipment
Lasers, transits
GPS
Data collectors
Flow monitoring equipment
Calculators
Personal protection equipment
Radios
FAX machines
Telemetering equipment
Electrical test equipment
SCADA
Gas detectors
Megger
Force main pig
Chemical coatings
Dye
Smoke generators/blowers
Pumps
Generator
Lab equipment
Sewer cleaning equipment
Flashlight
Mirror
Pipe locator (witching stick)
Pressure gauges
Small clean up equipment
Odorizer
Chalk and block
Stalling poles
Chain cutter

Future Trends and Concerns

CMOM compliance
NPDES program expansion
Minimum staffing concerns
Higher utility costs
Power reliability
Aging infrastructure
Technology overrun
Aging staff (knowledge drain)
Unavailability of parts/equipment
Lack of certified operators
Difficulty finding trained people