

**ASSESSMENT OF THE EXISTING AND FUTURE HYDROLOGIC  
DIVIDE OF MILLER, WALKER, AND DES MOINES CREEKS  
AFTER CONSTRUCTION OF MASTER PLAN UPDATE PROJECTS  
AT SEATTLE-TACOMA INTERNATIONAL AIRPORT**

**SEATTLE-TACOMA INTERNATIONAL AIRPORT  
MASTER PLAN UPDATE IMPROVEMENTS**

Prepared for

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**Assessment of the Existing and Future Hydrologic Divide of Miller, Walker, and Des Moines Creeks after Construction of Master Plan Update Projects at Seattle-Tacoma International Airport**

Master Plan Update (MPU) construction at Seattle-Tacoma International Airport (STIA) will require earth movement, new pavement, and construction of new drainage systems. These changes potentially modify the location and area of land that drains to Des Moines, Miller, and Walker Creeks. The Governor’s Certification requires that “the Port of Seattle will design and construct the third runway such that the project will not cause changes in the location of the hydrologic divide between Miller and Des Moines Creeks in a manner that alters the average instream flow of either creek.” The following text, figures, and tables demonstrate the Port’s compliance with this requirement of the Certification. Note that Walker Creek, a tributary of Miller Creek, has been separated and assessed individually for compliance with the Certification.

Figures A1a and A1b show the delineation of drainage basins in 1994 (the “existing condition”) and 2006 (the “future condition”) after MPU completion. The area depicted on these figures shows what has been called the “STIA” area in the Comprehensive Stormwater Management Plan (SMP). The STIA area represents all of the drainage basins that include MPU projects. There are no MPU project areas outside of the STIA area; however, not all of the basins shown in the STIA area have MPU projects, and many of the basins near the boundary of the STIA area are subject to minor changes only. The remaining drainage areas outside of the STIA area are unchanged in configuration hence they were not included in this analysis. Table A1 shows the area of each creek and the industrial wastewater system (IWS) in 1994 and 2006 within the STIA area.

**Table A1. Existing and future watershed areas at Seattle-Tacoma International Airport (acres).**

| <b>Watershed</b>                   | <b>1994</b>   | <b>2006</b>   |
|------------------------------------|---------------|---------------|
| Des Moines Creek                   | 1,679.7       | 1,587.6       |
| Miller Creek                       | 1,277.2       | 1,236.6       |
| Walker Creek                       | 233.7         | 234.0         |
| Industrial Wastewater System (IWS) | 291.4         | 423.7         |
| <b>TOTAL</b>                       | <b>3482.0</b> | <b>3481.9</b> |

Figures A2a and A2b depict the drainage subbasins in the Miller, Walker, and Des Moines Creek that are changed by the MPU. Within the change area are subbasins that will change configuration. Table A2 shows the area of those basins for each creek in 1994 and 2006, demonstrating that subbasin area is not gained or lost by changes in the boundaries of those subbasins modified for the MPU.

**Table A2. Area of subbasins in Figures A2a and A2b (acres).**

| 1994 Basins             |              | 2006 Basins     |              |
|-------------------------|--------------|-----------------|--------------|
| <b>Miller Creek</b>     |              |                 |              |
| M8                      | 28.8         | M8              | 28.8         |
| M9                      | 98.6         | M9              | 98.6         |
| M10                     | 203.3        | M10             | 203.3        |
| M16                     | 108.3        | M16             | 108.3        |
| MC2                     | 43.3         | MC2             | 43.3         |
| MC3                     | 26.0         | MC3             | 26.1         |
| MC4                     | 36.8         | MC4             | 39.6         |
| MC5                     | 53.6         | MC5             | 55.5         |
| MC6                     | 25.6         | MC6             | 15.6         |
| MC7                     | 54.5         | MC7             | 46.5         |
| MC6B                    | 103.4        | SDN3            | 47.9         |
| MC7B                    | 48.7         | SDN4            | 30.3         |
| SDN3                    | 65.6         | SDN3-X          | 25.4         |
| SDN4                    | 30.3         | SDN4-X          | 15.2         |
| SDN3-X                  | 25.4         | SDN-3A-O        | 19.9         |
| SDN4-X                  | 12.8         | SDN-3A-I        | 10.5         |
|                         |              | SDW-1A-I        | 37.6         |
|                         |              | SDW-1A-O        | 15.4         |
|                         |              | SDW-1B-O        | 17.0         |
|                         |              | SDW-1B-I        | 79.9         |
| <b>TOTAL</b>            | <b>965.0</b> |                 | <b>964.7</b> |
| <b>Des Moines Creek</b> |              |                 |              |
| STIA                    | 440.0        | SDS3A           | 69.8         |
| STIA                    | 0.7          | SDS3            | 339.8        |
| STIA                    | 0.7          | SDS3            | 0.7          |
| SDS5                    | 34.4         | SDS5            | 32.5         |
| SDS6                    | 48.7         | SDS6            | 16.7         |
| SDS7                    | 24.9         | SDS7            | 91.3         |
| <i>Subtotal</i>         | <i>549.4</i> | <i>Subtotal</i> | <i>550.8</i> |
| IWS                     | 4.0          | IWS             | 4.0          |
| IWS                     | 0.5          | IWS             | 1.2          |
| IWS                     | 1.5          |                 |              |
| IWS                     | 0.2          |                 |              |
| <b>TOTAL</b>            | <b>555.6</b> |                 | <b>556.0</b> |

**Table A2. Area of subbasins in Figures A2a and A2b (acres) (continued).**

| 1994 Basins         |              | 2006 Basins |              |
|---------------------|--------------|-------------|--------------|
| <b>Walker Creek</b> |              |             |              |
| MC8                 | 30.8         | MC8         | 26.7         |
| MC9                 | 13.7         | MC9         | 10.4         |
| MC8B                | 37.0         | SDW-2       | 44.6         |
| M20                 | 152.2        | M20         | 152.2        |
| <b>TOTAL</b>        | <b>233.7</b> |             | <b>233.9</b> |

Figure A3 shows the 1994 and 2006 basins overlay, with each “changed” basin area. This figure (with areas summarized in Table A3) shows the size and location of drainage subbasins that are modified for the future drainage conditions.

**Table A3. Area of subbasins in Figure A3 (acres).**

| 1994 Basins         |       | 2006 Basins |       |
|---------------------|-------|-------------|-------|
| <b>Miller Creek</b> |       |             |       |
| M8                  | 28.8  | M8          | 28.8  |
| M9                  | 98.6  | M9          | 98.6  |
| M10                 | 203.3 | M10         | 203.3 |
| M16                 | 108.3 | M16         | 108.3 |
| MC2                 | 43.3  | MC2         | 43.3  |
| MC3                 | 26.0  | MC3         | 26.0  |
| SDN3                | 47.9  | SDN3        | 47.9  |
| SDN4                | 30.3  | SDN4        | 30.3  |
| SDN3-X              | 23.9  | SDN3-X      | 23.9  |
| SDN3-X              | 1.4   | SDN3-X      | 1.4   |
| SDN3-X              | 0.1   | SDN3-X      | 0.1   |
| SDN4-X              | 12.8  | SDN4-X      | 12.8  |
| MC4                 | 36.8  | SDN3-X      | 1.0   |
| MC5                 | 53.6  | SDN3-X      | 0.5   |
| MC6                 | 15.4  | SDN4-X      | 2.4   |
| MC7                 | 46.5  | SDN-3A-I    | 10.2  |
| SDN3                | 2.4   | SDN-3A-I    | 0.4   |
| SDN3                | 1.0   | SDN-3A-O    | 18.5  |
| SDN3                | 0.4   | MC4         | 2.8   |
| SDN3                | 7.80  | MC6         | 0.3   |
| SDN3                | 3.80  | SDW-1A-I    | 7.8   |
| SDN3                | 2.40  | SDW-1A-I    | 29.7  |

**Table A3. Area of subbasins in Figure A3 (acres) (continued).**

| 1994 Basins                     |              | 2006 Basins |              |
|---------------------------------|--------------|-------------|--------------|
| <b>Miller Creek (continued)</b> |              |             |              |
| MC6B                            | 0.5          | SDW-1A-O    | 13.1         |
| MC6B                            | 10.2         | SDW-1A-O    | 2.2          |
| MC6B                            | 18.5         | SDW-1B-I    | 3.8          |
| MC6B                            | 2.8          | SDW-1B-O    | 6.2          |
| MC6B                            | 0.3          | SDW-1B-0    | 1.0          |
| MC6B                            | 13.1         | SDW-1B-I    | 27.4         |
| MC6B                            | 29.7         | MC5         | 1.8          |
| MC6B                            | 1.0          | SDW-1B-I    | 36.7         |
| MC6B                            | 27.4         | SDW-1B-I    | 11.9         |
| MC6                             | 2.2          | SDW-1B-O    | 7.5          |
| MC6                             | 6.2          | SDW-1B-O    | 2.3          |
| MC6                             | 1.8          | MC4         | 36.8         |
| MC7                             | 7.5          | MC5         | 53.6         |
| MC7B                            | 2.3          | MC6         | 15.4         |
| MC7                             | 0.4          | MC7         | 46.5         |
| MC7B                            | 36.7         |             |              |
| MC7B                            | 9.7          |             |              |
| <b>TOTAL</b>                    | <b>965.1</b> |             | <b>964.5</b> |
| <b>Des Moines Creek</b>         |              |             |              |
| STIA                            | 334.4        | SDS3        | 334.4        |
| STIA                            | 0.7          | SDS3        | 0.7          |
| STIA                            | 58.7         | SDS3A       | 58.7         |
| STIA                            | 11.9         | SDS3A       | 2.4          |
| STIA                            | 19.7         | SDS7        | 26.2         |
| STIA                            | 14.8         | SDS7        | 14.8         |
| STIA                            | 0.3          | SDS7        | 3.4          |
| STIA                            | 0.7          | SDS7        | 0.7          |
| SDS5                            | 32.4         | SDS5        | 32.4         |
| SDS6                            | 5.7          | SDS6        | 5.7          |
| SDS6                            | 1.8          | SDS6        | 1.8          |
| SDS7                            | 3.6          | SDS7        | 3.6          |
| SDS7                            | 1.9          | SDS7        | 1.9          |
| SDS7                            | 7.3          | SDS3        | 0.5          |
| SDS5                            | 0.5          | SDS6        | 0.2          |

**Table A3. Area of subbasins in Figure A3 (acres) (continued).**

| 1994 Basins                         |              | 2006 Basins     |              |
|-------------------------------------|--------------|-----------------|--------------|
| <b>Des Moines Creek (continued)</b> |              |                 |              |
| SDS5                                | 1.5          | SDS6            | 1.5          |
| SDS6                                | 2.6          | SDS3A           | 2.6          |
| SDS6                                | 38.1         | SDS7            | 38.1         |
| SDS6                                | 0.5          | SDS6            | 7.3          |
| SDS7                                | 0.4          | SDS3            | 0.4          |
| SDS7                                | 5.9          | SDS3A           | 5.9          |
| SDS7                                | 4.5          | SDS3            | 4.5          |
| SDS7                                | 1.2          | SDS7            | 0.3          |
| <i>Subtotal</i>                     | <i>549.1</i> | SDS7            | 1.5          |
| IWS                                 | 1.5          | SDS7            | 0.3          |
| IWS                                 | 4.0          | SDS7            | 0.3          |
| IWS                                 | 0.3          | SDS6            | 0.2          |
| IWS                                 | 0.2          | <i>Subtotal</i> | <i>550.3</i> |
| IWS                                 | 0.2          | IWS             | 4.0          |
|                                     |              | IWS             | 1.2          |
| <b>TOTAL</b>                        | <b>555.3</b> |                 | <b>555.5</b> |
| <b>Walker Creek</b>                 |              |                 |              |
| M20                                 | 152.2        | MC8             | 26.7         |
| MC8                                 | 26.7         | MC9             | 9.9          |
| MC8                                 | 4.0          | SDW-2           | 4.0          |
| MC9                                 | 9.9          | SDW-2           | 10.7         |
| MC9                                 | 3.4          | SDW-2           | 9.7          |
| MC8B                                | 26.2         | SDW-2           | 0.4          |
| MC8B                                | 10.7         | SDW-2           | 19.7         |
| MC9                                 | 0.3          | M20             | 152.2        |
|                                     |              | MC9             | 0.5          |
| <b>TOTAL</b>                        | <b>233.4</b> |                 | <b>233.8</b> |

Table A4 summarizes average annual flows in Miller, Walker, and Des Moines Creeks at locations immediately downstream of the MPU projects. This table shows that there will be no loss of annual average stream flows in the basins as a result of the MPU projects or increase in IWS drainage area.

**Table A4. Average annual streamflow (cfs).**

| <b>Watershed</b>              | <b>1994</b> | <b>2006</b> |
|-------------------------------|-------------|-------------|
| Des Moines Creek <sup>1</sup> | 4.38        | 4.43        |
| Miller Creek <sup>2</sup>     | 3.91        | 4.05        |
| Walker Creek <sup>3</sup>     | 0.12        | 0.13        |

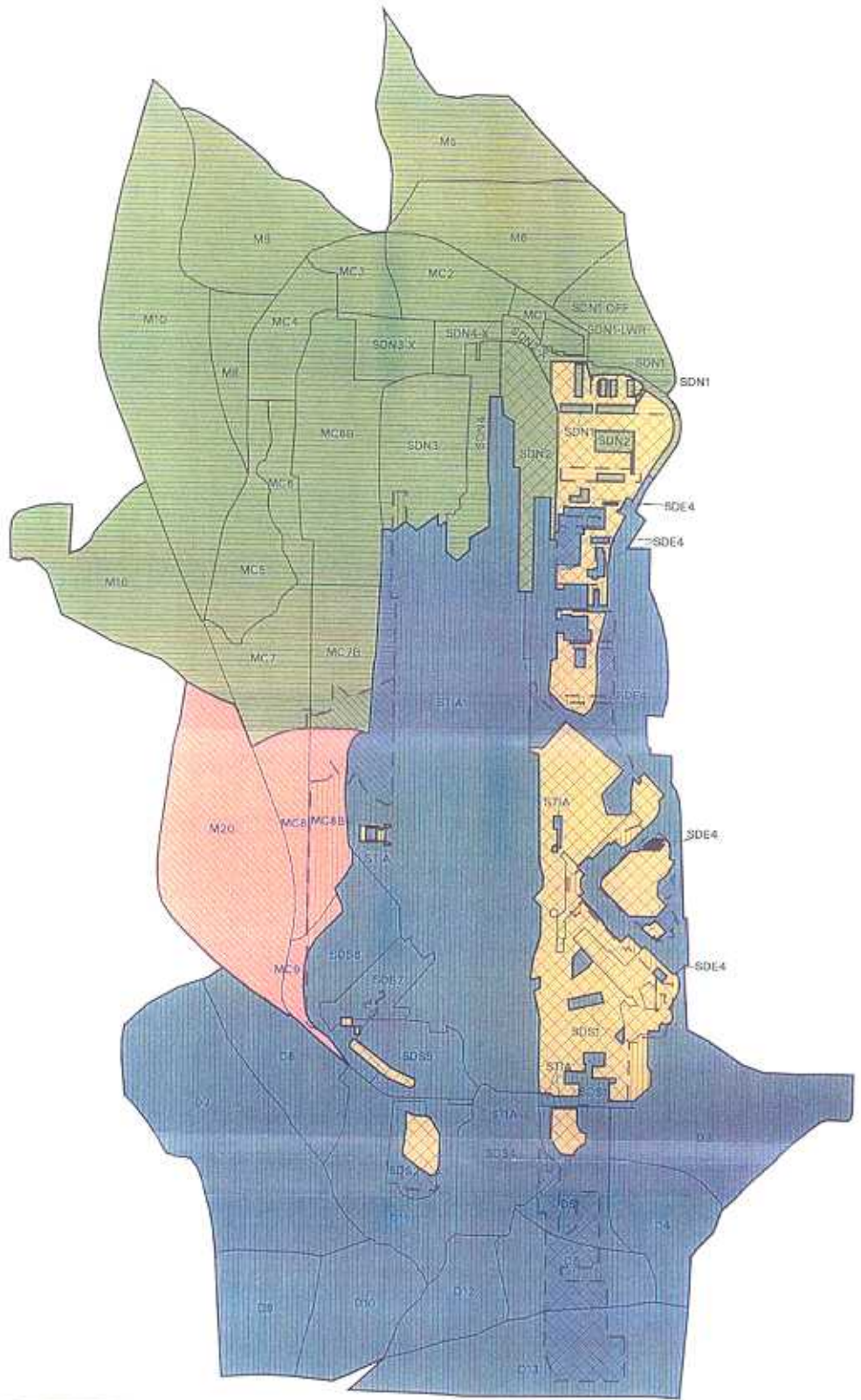
<sup>1</sup> At South 200th Street.

<sup>2</sup> At SR 509.

<sup>3</sup> At SDW2 outlet.

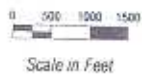
In summary, the information provided here demonstrates:

- The drainage basin area located on the divides between Miller, Walker, and Des Moines Creek basins does not change by more than 1 acre in area.
- The Miller, Walker, and Des Moines basins gain or lose less than 1 acre of drainage area to each other.
- The average annual instream flow is not decreased in any of the three basins. Minor increases in average annual flows are due to (mitigated) increased runoff from new impervious areas.
- The insignificant (less than 1 acre) gain or loss in drainage area does not measurably change the average annual instream flow in the creeks.



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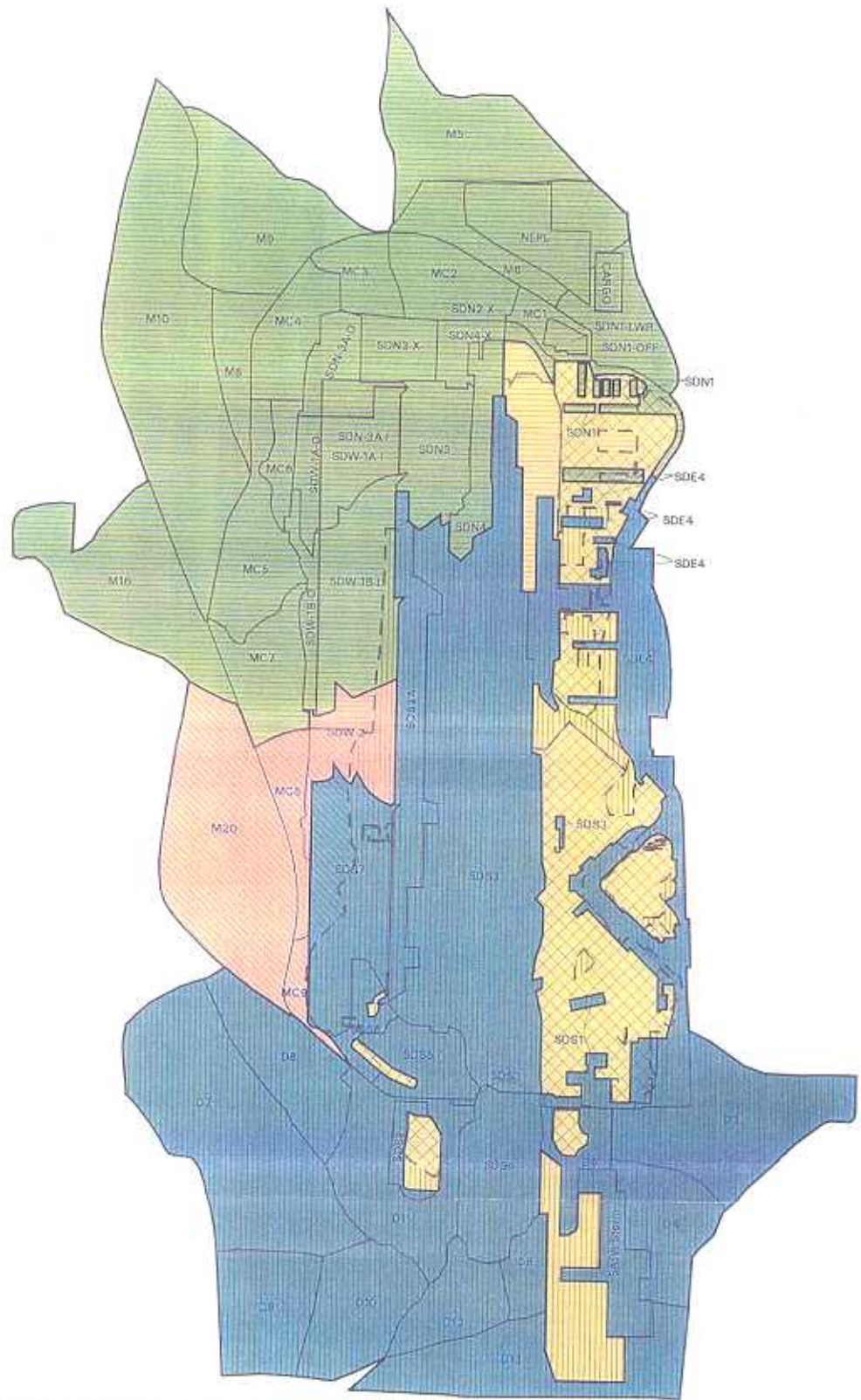
- |                                    |                                  |                                   |
|------------------------------------|----------------------------------|-----------------------------------|
| Existing Miller Creek Watershed    | Future Miller Creek Watershed    | Existing Watershed Boundary       |
| Existing Walker Creek Watershed    | Future Walker Creek Watershed    | Future Watershed Boundary         |
| Existing Dea Moore Creek Watershed | Future Dea Moore Creek Watershed | Existing (1994) Subbasin Boundary |
| Existing IWS                       | Future IWS                       |                                   |

**Figure A-1a**  
Existing and Future Watersheds with Existing (1994) Subbasins

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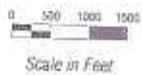




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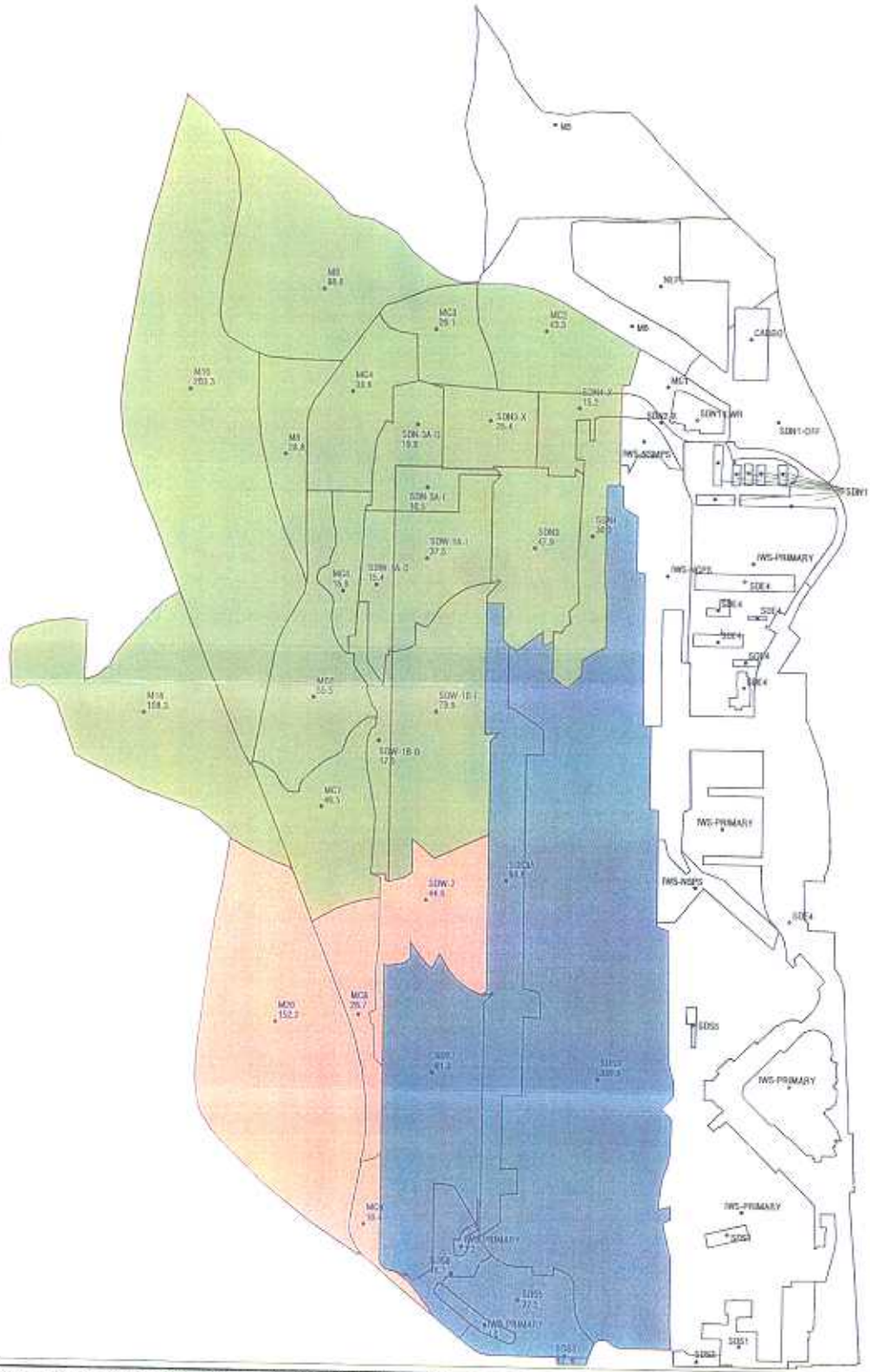
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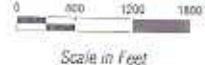
- Existing Miller Creek Watershed
- Future Miller Creek Watershed
- Existing Des Moines Creek Watershed
- Future Des Moines Creek Watershed
- Existing WS
- Future WS
- Existing Watershed Boundary
- Future Watershed Boundary
- Future (2006) Subbasin Boundary

**Figure A-1b**  
Future and Existing  
Watersheds with  
Future (2006) Subbasins



AR 050790

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- Future Miller Creek Watershed
- Future Walker Creek Watershed
- Future Des Moines Creek Watershed
- Future (2006) Subbasin Boundary
- Subbasin Name
- Subbasin Area in Acres

Figure A2b  
Future Subbasins  
(2006)



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- Complete basins that are not modified from 1994 to 2008
- Portion of the modified basins that were not changed from 1994 to 2008
- Portion of the modified basins that changed from 1994 to 2008

- MCS (1st Position = Basin Name)  
25.0 (2nd Position = Acres)
- MCA (1st Position = Basin Name)  
20.8 (2nd Position = Acres)
- MCSB (1st Position = Existing Basin Name)  
MCA (2nd Position = Future Basin Name)  
2.8 (3rd Position = Acres)

- Existing Watershed Boundary
- Future Watershed Boundary

**Figure A3**  
Existing and Future Watershed and Subbasin Overlay with Polygon Areas