

## **Narrative Discussion of the City of Huntsville Storm Water Management Program**

An NPDES (National Pollutant Discharge Elimination System) Permit was initially issued to the City of Huntsville, the City of Madison and the Alabama Department of Transportation in March 1996. The Permit authorized the discharge of storm water from the Municipal Separate Storm Sewer System (MS4), and contained numerous sampling and reporting requirements, as well as the implementation of various Best Management Practices to control storm water quality. In September 2001, the NPDES MS4 Permit was renewed with minor changes to the monitoring requirements. These specifically involved addition of a low-density residential storm water sampling site for the City of Huntsville, and a change in the outfall employed for representative sampling of storm water runoff from industrial property in the City of Huntsville. In addition, the Permit renewal authorized changes to the dry weather screening methods utilized by the City of Huntsville. All of these minor changes to monitoring requirements were requested by the City of Huntsville, and there were no other changes to the MS4 Discharge Permit at renewal. Since that time, ADEM (Alabama Department of Environmental Management) has reopened the Permit and proposed a number of changes. The proposed changes reflect implementation of ADEM's Phase II storm water regulations for construction sites and the progress that has been achieved in developing TMDL's (Total Maximum Daily Loads). A Draft Permit reflecting the proposed changes was forwarded to the City of Huntsville under cover of Truman Green's transmittal letter dated September 27, 2004, and the City of Huntsville provided minor comments on the Draft (reference D. Shea's comment letter to T. Green dated October 27, 2004). A Final Permit has not yet been issued. Consequently, this narrative section does not reflect the proposed changes to the MS4 Permit.

The reporting requirements included in Part V, Section B of the NPDES Permit specify that each co-permittee is to include a narrative discussion of each element of their Storm Water Management Program (SWMP) in the Annual Report for the fourth year of the permit term. The format for this narrative is specified, and the SWMP elements to be included are enumerated within the Permit. This narrative section of the Annual Report for fiscal year 2004 is intended to satisfy this requirement.

Each section of the narrative is devoted to a specific element of the SWMP, and each section includes a separate discussion of that element's objective, status of implementation, strengths and weaknesses, etc. This discussion attempts to provide an overview of the SWMP, and also serves to illustrate how the objectives and implementation of the SWMP are integrated with the myriad other responsibilities of municipal government. For this reason, the discussion alludes to numerous activities that are not exclusively related to water quality. This is done in the hope of providing a broader perspective on the program and to provide insight into the extent to which Huntsville has harmonized the objectives of the SWMP with other responsibilities of the City.

The overall objective of the SWMP is to limit the discharge of pollutants in municipal storm water to the "Maximum Extent Practicable." Achievement of this goal is best realized if elements of the SWMP embrace numerous areas of responsibility and involve numerous City agencies. This is a salient characteristic of Huntsville's program.

## 1. STRUCTURAL CONTROLS

**a. Objective** – The City of Huntsville adopted a comprehensive Storm Water Management Manual (Ordinance 91-375) in 1991. The SWMM requires a hydrologic evaluation of each proposed development and further requires the implementation of sufficient measures to ensure that the peak rate of runoff after development is no more than 2.5 cfs greater than the pre-development peak. This has resulted in the construction of a number of storm water retention basins in areas of new development within the City throughout the 1990's and early years of the 21<sup>st</sup> Century. The principal objective of the structural controls is to control flooding by dampening the hydrograph peaks in the receiving streams. A secondary goal is to limit erosion and the resulting siltation of receiving streams, again principally for the purpose of controlling flooding. However, storm water retention and the resultant reduction of the peak rate of discharge also serve to enhance water quality by reducing the TSS (Total Suspended Solids) concentration in the storm water discharge. Since many pollutants commonly found in urban storm water are constituents of particulate matter or are adsorbed to soil particles, reducing the TSS concentration serves to lower the concentrations of other pollutants as well.

**b. Program element activities completed and in progress** – At the time of submittal of Part I of the MS4 NPDES Permit application, the only storm water retention facilities within the City were located in the area of Cummings Research Park and at Oakwood College. These facilities are described in Section 3.9 of the Part I submittal, dated May 18, 1992. At the time the last comprehensive narrative report was submitted in 2000 (reference the FY 1999 MS4 Annual Report), 27 additional retention/detention ponds had been constructed, ranging in size from 0.10 acres to 26.3 acres. A description of these facilities may be found in the Annual Reports for 1996 through 1999. An additional 23 retention/detention facilities are described in the Annual Reports for Fiscal Years 2000 through 2003.

**c. General discussion of element** – As alluded to in the objective section, Huntsville's SWMM requires that post-development peak runoff rates do not exceed the pre-development peak. More specifically, retention is required if the calculated peak rate of run-off from a ten year return period, twenty-four hour duration, Type II storm is significantly greater after site development than before site development. However, there is a *de minimis* impact exception, and retention is not required if the post-development peak exceeds the pre-development peak by 2.5 cfs or less. As noted above, 50 retention basins have been constructed within the City since submittal of part I of the NPDES application, bringing the total number of retention basins to 52 at the end of Fiscal Year 2003. This total does not include those described in Appendix A of this Annual Report.

As a component of the commercial or residential sub-division approval process, the SWMM requires developers to provide a detailed hydrologic evaluation of the project, including pre- and post-development hydrologic calculations, reservoir routing calculations, etc. A drainage plan with two-foot contours and drainage arrows must be supplied, as well as detailed design information for drainage structures such as catch basins, culverts, detention/retention facilities, inlets and outlets. These requirements are presented in greater detail in Section 2.4.2 of the

SWMM. In addition, an erosion control plan must be prepared and implemented. Reference Section 3.2.6 of the SWMM and the technical standards for structural and non-structural controls found in Chapter 10 of the manual. Also relevant to this discussion is the requirement to prepare a maintenance plan for any retention basin (see Section 3.2.5 of the manual). Specifically required within the maintenance plan is the provision of drainage easements of adequate width to provide access for maintenance activities.

**d. Compliance Status** – The Storm Water Management Manual of the City of Huntsville has been in place since 1991 and is being fully implemented. The City is in compliance with the requirements of this element of the SWMP.

**e. Strengths and Weaknesses** – Several aspects of this element of the SWMP are viewed as significant strengths. Included among the strong points are the integration of detailed hydrologic assessment in the planning process, and the requirement to evaluate the impact of proposed development on the City’s drainage infrastructure and the resultant ability of the overall system to accommodate storm water runoff. The effect of these requirements is to identify situations in which retention facilities are needed and incorporate their design and construction into each overall development plan. As noted earlier, the inclusion of retention facilities in both commercial and residential developments has provided a net positive effect on water quality by reducing the peak rate of runoff and consequently lowering the suspended solids loading to the urban receiving streams.

Despite the beneficial effects associated with Huntsville’s approach to storm water retention, both from a flood control standpoint and a water quality standpoint, there are several weaknesses associated with this approach. Because each development is evaluated in relation to its impact on the drainage system, retention facilities are sized for individual developments. The result is that retention facilities are provided incrementally and several retention facilities may be provided in an area as it develops. In other words the need for retention facilities within each watershed is not evaluated holistically. There may be cases where regional retention would make more sense in the long run in light of the ultimate development of an area. However, the actual pattern of development tends to result in construction of several smaller retention structures. An exception to this general pattern involves the industrial park areas developed by the City. The most notable example is Cummings Research Park in which several large lakes have been constructed to provide storm water detention/retention for the entire development. This has worked well, not only in terms of efficient use of land, but in providing notable aesthetic amenities to the overall development.

The tendency to provide a larger number of smaller retention structures exacerbates the ongoing challenge of facility maintenance, which is viewed as another weakness of the program as presently structured. Under existing City requirements, the owner of the facility is required to provide for ongoing maintenance. In the case of commercial developments and the industrial parks, this arrangement works well and responsibilities are well defined. However, in residential developments the responsible party is typically the homeowners association. In subdivisions with a strong, active home owners association this arrangement has been sufficient to ensure adequate maintenance, particularly in those areas for which the storm water retention facilities

provide an aesthetic amenity to the community. A good example of such a situation is in the Morning Side development in south Huntsville. In this case, several prominent lakes were constructed to provide storm water retention/detention, and the lakes were used as a principal marketing tool in selling lots and homes in the subdivision. The homeowners association is active in this neighborhood, views the lakes as a valuable community asset, and has been proactive in ensuring adequate maintenance. Not all subdivisions have such an active homeowners association, however, and it has become clear that the City will ultimately have to assume the responsibility for maintaining the retention facilities in these areas.

For a number of years after adoption of the SWMM, the City of Huntsville grappled with the policy implications of assuming responsibility for major maintenance of purportedly privately owned retention ponds. Would the City assume the maintenance responsibilities for facilities in some residential areas, but not others? Would the City provide major maintenance support (e.g. silt removal) in all residential areas, but continue to rely on homeowners to provide routine maintenance (e.g. grass cutting and litter removal)? As the number of retention ponds has grown and the age of some of these basins has reached the decade mark, the City has recognized that the ongoing effectiveness of these facilities in preventing localized flooding necessitates performance of some major maintenance by the City. Consequently, silt removal by the City has been performed as necessary to ensure the ongoing efficacy of several retention basins. This precedent is undesirable in that it imposes an ongoing maintenance burden on the City's Public Works Department, which will only increase in the future. On the other hand, it seems to be an inevitable consequence of SWMM adoption.

A final possible weakness worthy of brief mention is the use of the 10-year storm event to design storm water retention facilities. Consideration of the 25, 50 or 100-year event would provide greater protection, but in all probability would result in further increases to development cost. Again, any change to existing requirements would have substantial policy implications that must be weighed very carefully prior to implementation. The City's Surface Water Management Committee (formerly the Flood Mitigation Committee) continues to wrestle with this problem, as alluded to in their 2004 Annual Report (reference Appendix F).

**f. Assessment of Controls** – The retention requirements of the SWMM are serving their intended purpose, i.e. peak runoff rates from new development are being constrained. However, there are several problems associated with the structure of the existing requirements, as described in some detail above. Huntsville is in the early stages of addressing these weaknesses (see below). Overall, this element of the SWMP is successful and is effective. There is room for improvement, however.

**g. Discussion of Proposed Revisions** - At the time the last comprehensive narrative was submitted (reference the 1999 Annual Report), the City's Engineering Division had drafted revisions to the SWMM which would address the problems noted in the preceding discussion of program element strengths and weaknesses. These revisions are still in Draft form. The purely internal process of soliciting input, i.e. from other City agencies such as Legal, Planning, Public Works, etc., has been completed. Representatives of the development and construction communities have been engaged in the discussion of revisions to the SWMM. Although this

committee, consisting of City and private sector representatives, has been tasked with making final recommendations to the Surface Water Management Committee, the initial deadline for doing so has long-since passed and this is not currently viewed as a pressing priority. Serious consideration of revisions to the SWMM will probably not precede completion of the hydrologic modeling effort.

## 2. DEVELOPMENT PLANNING PROCEDURES

**a. Objective** – Land development within the City of Huntsville must be done in accordance with the City’s Subdivision Regulations. The purpose of these regulations is to promote orderly development, protect natural resources and limit the effects of air and water pollution, minimize conflicts among land uses and establish reasonable standards of design. Design standards serve to protect life and property, limit damage due to flooding and slope deterioration and ensure that roads and utilities are constructed so as to minimize public service and maintenance costs. These objectives, as well as ancillary goals of the subdivision regulations, are enumerated within Part 1.2 of the regulations. The full text of the regulations may be found at the City’s web-site <http://www.hsvcity.com/Planning/publications.php>.

**b. Program Element Activities Completed** – The Subdivision Regulations have been in place for many years, but they are updated periodically to reflect the changing needs of the community. An example of this evolution that is of particular relevance to this discussion is the incorporation of conforming amendments to the Subdivision Regulations at the time the Storm Water Management Manual was adopted by the City in 1991.

**c. General Discussion** – As noted above, the requirements of the SWMM related to new development or redevelopment are incorporated into the City of Huntsville Subdivision Regulations by reference. These requirements are of particular relevance to this narrative, as are the requirements to conform to City engineering specifications for public improvements, and the special restrictions that apply to land development in floodways and floodfringe areas. Particular note should be made of references to these requirements in the ensuing general discussion of planning procedures.

The Subdivision Regulations include procedural requirements, which can be found in Article 3 – “Subdivision Application Procedure and Plat Requirements.” Applicants proposing to subdivide land for development are encouraged to discuss the requirements and necessary approvals with the City’s Planning Director, thereby facilitating smooth execution of the process. The first formal step in the subdivision approval process involves application for approval of a layout. The application must be accompanied by a set of layout documents, which include a vicinity map, a slope map, a site assessment map and report, and a sketch plat reviewed and signed by the City’s Traffic Engineer. The sketch plat shows locations and widths of all existing and proposed rights-of way, proposed lot boundaries, locations of existing and proposed improvements and other information more fully described in 3.2(3)A. of the regulations. The slope map delineates existing slope categories, as well as the approximate locations of all areas of proposed roads for which excavation and fill exceeds 10 feet in depth. The site assessment map and associated

report address natural hazards and sensitive environmental features. Included are geologic formations (e.g. caves, sinkholes, solution features, landslides, etc.), soil types and areas of colluvium, hydrologic features (springs, streams, wetlands and ground water recharge points), vegetative communities and endangered species habitats. Also included are man-made hazards and features such as mines and quarries, spoils areas, wells, dump sites, storage tanks and features of historical or archeological significance. If construction is proposed on land where colluvium or other unstable soils are present, where previous mining operations were conducted or where historical dumping has occurred, a geotechnical investigation must be conducted in accordance with an approved testing plan.

The Subdivision Committee of the Planning Commission reviews the layout submittal and reports the results of their evaluation to the Commission, which may hold a public hearing on the layout. In response to comments from the public, public agencies and officials, and the review of the Subdivision Committee, the Planning Commission advises the applicant of any necessary changes and additions. Once changes have been incorporated to the satisfaction of the Commission, the applicant may proceed with an application for a preliminary plat.

The application for a preliminary plat must be supported by a series of required documents. Included are certified construction plans, geodetic control and references, exact boundary lines and lot lines, street centerlines and geometrics, rights-of-way, sidewalks, easements, buffer strips, building setback lines, floodway and floodfringe boundaries, and the results of any requisite geotechnical investigation and testing. Construction plans must include a base map with boundaries, setbacks, streets, and lot lines, vegetation plans where buffer strips are required, a street plan, a grading and erosion control plan, a storm water drainage and sanitary sewer plan, and construction certifications for each utility service that is to be provided (water, electric, telephone, cable, etc.). Additional detail on the information that must be included in each of these plans may be found in Part 3.3 of the Subdivision Regulations.

After receipt of all of the documents and construction plans required as components of the preliminary plat approval application, the Planning Commission must hold a public hearing. The Planning Commission then approves or disapproves the preliminary plat based on their review of the application, public comments, input from involved agencies and officials, and the report of the subdivision committee.

Following approval of the preliminary plat, the applicant must file an application for approval of a final plat. The final plat must be accompanied by a performance bond as required, and must include notation of any plat restrictions. Similarly, any plat restrictions due to identification of natural or man-made hazards must be recorded with the Probate Judge, reflecting the requirement that all construction plans submitted for a building permit must be certified by a geotechnical engineer. Actual construction must also be certified by a geotechnical engineer prior to issuance of a certificate of occupancy. The final plat application must also include a title opinion from a licensed attorney, and certifications from the professional land surveyor, the licensed geotechnical engineer (if applicable), the Engineer of Record, the City Engineer, Huntsville Utilities, the Madison County Health Department (if septic tank installation is proposed), and certificates for approval by the Planning Commission and for recording by the

Probate Judge. After review of the final plat the Planning Commission either approves the plat for recording or disapproves the plat stating the reasons for disapproval. Up to two years may be provided for completion of the required improvements. The final plat is then recorded and copies are provided to each of the certifying agencies.

The preceding discussion has focused on the procedural requirements and the general nature of the information, investigations, and construction plans that must be provided throughout the subdivision approval process. However, there is a rather large body of technical standards and local regulations that must be followed as well. Among these are the Zoning Regulations, including the special requirements applicable to flood plains and flood fringe areas and slope districts. Also included are the provisions of the Storm Water Management Manual, and the City of Huntsville Engineering Specifications for improvements that will ultimately be conveyed to the City, such as streets, sanitary sewer and drainage systems.

**d. Compliance Status** – The regulations are being fully implemented, including the planning requirements associated with the SWMM. Huntsville is consequently in full compliance with this element of the SWMP.

**e. Strengths and Weaknesses** – The Subdivision Regulations successfully serve to promote orderly development and effectively ensure that public improvements associated with land development conform to City construction standards, including those applicable to drainage systems and those included in the SWMM. Thus, they satisfy their stated objectives. The principal criticisms of the regulations involve the cost of compliance to developers, the extensive procedural requirements and the strictures they impose on innovative land development concepts. Each of these weaknesses warrants some further discussion.

It is undoubtedly true that requirements for sidewalks, proper drainage, sanitary sewer, underground utilities and street construction that meet City engineering standards increase the cost of development. This cost is passed on to persons buying new homes, occupying new industrial facilities or leasing new commercial space. However, the alternative is more costly in the long run and must be borne by the general public. Substandard streets require more frequent repair and maintenance and ultimately must be upgraded. Above ground utilities increase the frequency of service interruptions and the cost of responding to weather events such as ice storms. Inadequate drainage exacerbates flooding problems and contributes to water quality impairment. Septic tanks are a principal source of ground water contamination, particularly in areas of Karst topography such as Madison County. For all of these reasons, the increased cost of development associated with municipal regulation is more than offset by the long-term savings to the public that result from ensuring public infrastructure is adequate, well-designed and well-constructed.

Procedural complexity and the potentially large number of reviewing agencies and officials can inject delays into the development process. It is inherently difficult to balance the objectives of the Subdivision Regulations, which can only be met if there is fairly extensive technical review, with a streamlined process. In an effort to make the process more manageable, developers are strongly encouraged to meet with the Planning Director before initiating the process. This

provides the applicant with a broad overview of the requirements and provides insight into the technical personnel needed for development of the application. A meeting between the Engineer of Record and/or the layout architect with public officials is similarly encouraged to clarify requirements and avoid delay. Public agencies represented in these meetings vary with the nature of the development, but typically include the City Engineer, Huntsville Utilities representatives, the Inspection Department, the Traffic Engineer and Planning Department staff. Natural Resources and the Health Department participate as appropriate. Although these meetings do not change the fact that a great deal of work is required, they help avoid last minute surprises regarding requirements.

Finally, the subdivision approval process has been criticized for promoting a “cookie-cutter” approach to land development by mandating minimum building setbacks, lot sizes, easement locations and widths, landscaping requirements, etc. Planned Urban Developments (PUDs) that employ innovative approaches to land access, distribution of green space and clustering of structures may consequently face a more lengthy approval process. However, this approval process has been successfully navigated in Huntsville, the most notable example being the upscale Providence development in the rapidly growing western area of the City.

**f. Assessment of Controls** – Overall, the planning procedures of the City of Huntsville have been very successful. Huntsville continues to work toward ensuring that architects, engineers and other professionals involved in the layout and detailed design of land development projects are adequately apprised of all relevant requirements as early in the planning process as possible.

**g. Discussion of Proposed Revisions** – No changes to the Subdivision Regulations or planning procedures that are of particular importance to storm water management are presently being proposed or contemplated.

### **3. ROADWAY MAINTENANCE**

**a. Objective** – Roadway maintenance activities are primarily designed to provide for public safety and enhance the aesthetics of roadsides within the City. Components of the roadway maintenance program include repair activities, vegetation maintenance along roadsides, deicing and sanding of roadway surfaces in response to winter weather events, street sweeping and litter removal activities. Repair activities, and deicing activities are conducted for safety reasons, whereas litter removal is performed primarily to promote aesthetics. Vegetation maintenance and street sweeping enhance both traffic safety and aesthetic aspects of public thoroughfares. Aspects of each of these activities have a bearing on water quality and therefore must be integrated with the City’s SWMP. Street sweeping and litter removal programs have a direct beneficial effect on storm water quality and there is no conflict between the principal objective of these activities and the SWMP. On the other hand, vegetation maintenance, roadway repair and deicing activities have potentially deleterious effects on water quality and Best Management Practices (BMPs) have been incorporated into their execution to harmonize their principal objective with the SWMP.

**b. Program Element Activities Completed** – Applicable BMPs have been integrated into roadside maintenance and deicing activities and are being fully implemented by the City of Huntsville. Mechanical vegetation maintenance methods are employed to the extent practicable along roadsides, and the City uses certified technicians to apply herbicides when pesticide use is necessary. A comprehensive program of litter removal is being implemented. Additional detail is provided on each of these components of roadway maintenance in the ensuing general discussion. The City is presently in compliance with these requirements of the SWMP.

**c. General Discussion – Road Repair Activities:** The City of Huntsville contracts all larger road repair projects, such as resurfacing. (Huntsville's Public Works Operations Division does not have paving equipment. Consequently, larger projects cannot be done in-house). Road repair activities performed by City crews are limited to pot hole repair, and repair activities are confined to the street surface itself. Because of the nature of the work done by City crews, many of the Best Management Practices suggested in EPA's Guidance Manual are not applicable, or are incorporated as a necessary consequence of the scope of work. (Reference Guidance Manual For the Preparation of Part 2 of the NPDES Permit Applications for Discharges From Municipal Separate Storm Sewer Systems; Document No. EPA 833-B-92-002; November 1992).

The discussion included in EPA's Guidance Manual focuses primarily on limiting erosion potential from road maintenance and repair. Recommended practices include limiting the size of areas disturbed, limiting the size of areas being graded to allow stabilization by the end of the workday, and scheduling repair activities during dry seasons to the extent possible. As noted above, provisions to limit erosion potential are inherent in the nature of the work performed by City crews, because the repair activities typically do not include any disturbance of the Right-of-Way, nor do they involve grading work.

EPA's Guidance manual also identifies municipal vehicle maintenance shops that support road maintenance activities as potentially significant sources of pollutants. Procedures that address spill prevention, material management practices and good housekeeping in the vehicle maintenance shop are therefore recommended components of a program to limit pollutant discharges from road repair activities. In 1995, Huntsville's Division of Natural Resources conducted a comprehensive environmental audit of the Fleet Management Division's vehicle maintenance shop at the request of City managers. The scope of the audit included the full gamut of potential environmental concerns, including Clean Air Act requirements, RCRA requirements applicable to small quantity generators, requirements applicable to owners and operators of Underground Storage Tanks, and Clean Water Act requirements regarding spill control and wastewater discharges. As a result of the audit several improvements in spill prevention were recommended and subsequently implemented. Natural Resources personnel have done spot-inspections from time to time since the initial evaluation was done to ensure that spill control BMP's continue to be implemented properly. The most recent such inspection was conducted in 2003. As part of their internal procedures, Fleet Management recently requested an inspection by Natural Resources to ensure that there are currently no deficiencies. This will be done in the near future, but no problems are anticipated. [**Note:** This inspection was performed in March 2005, shortly before the final review of the Narrative. There were several minor changes

in the Fleet Maintenance Shop operations, but no deficiencies were noted with respect to BMP implementation.]

At present, Best Management Practices germane to storm water quality protection include spill prevention measures. Specifically, waste oil bulk storage tanks are located in a contained, covered area outside the facility; lead acid storage batteries awaiting pick-up for recycling are kept in a small storage shed, and are not exposed to storm water. Oil, hydraulic fluids and cleaners are stored inside the building, well away from outside doors, as are mineral spirits parts cleaners. Thus, there are no "significant materials" which are exposed to storm water. The small quantities of hazardous waste generated, primarily flammable liquids, are handled under contract by Safety-Kleen. Used oil and anti-freeze are periodically picked up for off-site reclamation by a waste oil service.

***Deicing Activities*** - As has been noted in previous Annual Reports, the City employs relatively simple, yet extremely effective BMPs to limit the discharge of pollutants resulting from deicing activities. Salt, used as a deicing material, is stored in bags and under roof. Relatively small amounts of salt are used, primarily on roadways with steeper grades. Larger amounts of gravel are used (typically on bridges and overpasses) and this material is purchased in bulk. All of the gravel mix used to provide traction on icy streets is stored in stockpiles that are under roof. Consequently none of the deicing materials are exposed to storm water during storage and there is no threat of release to the storm sewer system. Since the total quantities of material required each year are relatively small, and the need is extremely unpredictable, these measures are feasible for the City of Huntsville. This is not the case in colder climates, however.

Winter weather events in Huntsville are generally of very short duration. Once the event is past, and the deicing materials are no longer needed, Public Works Services deploys the City's street sweepers to remove the material from the roadways for landfill disposal. Thus, deicing materials are only applied when needed, generally remain on the roadways for a very short period of time, and are removed as soon as practicable after the winter weather event.

***Street Sweeping*** - Street sweeping responsibilities were transferred from the Landscape Management Division to the Public Works Operations Division in FY 1999. Although this involved a transfer of personnel and equipment from one City Department to another, no substantive changes in the program are associated with the transfer. Street sweeping of major thoroughfares and of high profile areas (such as the downtown area) is done on a regular basis. As a component of the Annual Report, information on the lane-miles swept during each fiscal year is provided annually to ADEM.

***Vegetation Maintenance*** - Mechanical methods (bush hogs, mowers, electric trimmers, etc.) are used whenever possible to limit the use of pesticides. Under the supervision of Huntsville Police Department's Community Service Division, inmate labor is used to mow utility easements and drainage ditch banks within the City. In addition, Landscape Management employees mow City parks, ditch banks, and roadside ROWs. Statistics on the acreage mowed are provided to ADEM each year in the storm water Annual Report. In cases where application of herbicides is

necessary, certified applicators spray the material. The number of certified spray technicians employed in the Landscape Management Division is included in each Annual Report.

**Litter Removal** - The City of Huntsville places a strong emphasis on beautification, and this is particularly evident in the range of litter removal programs that are in place within the City. Several agencies are involved, including the Landscape Management Division, Operation Green Team and the Community Service section of the Huntsville Police Department. Statistics on the quantity of litter removed, the man-hours devoted to litter collection, and the land areas involved have been included in each Annual Report (reference the Summary table and relevant appendices).

Operation Green Team provides public education on litter prevention and on other aspects of environmental protection (see separate discussion on public education activities). The Green Team also organizes volunteer projects such as the “Bag-a-Thon,” Neighborhood Pride Programs, and the Adopt-A-Mile program. Statistics on the amount of litter collected, and the number of participating volunteers and organizations are included in each Annual Report.

The Community Service Division of the Huntsville Police Department is responsible for supervising inmate and community service labor, which is utilized for litter collection along roadways as well as for mechanical vegetation maintenance of ditch banks and utility rights-of-way (see above). Statistics on the amount of litter collected and the number of man-hours devoted to this activity are included in the Annual Report each year.

Litter removal from public parks is the responsibility of the City’s Landscape Management Division. The amount of litter removed from public parks and recreational facilities is reported to ADEM each year as a component of the Annual Report.

**d. Compliance Status** – The programs described in this section of the narrative have been fully implemented and the City of Huntsville is in full compliance with these requirements of the SWMP.

**e. Strengths and Weaknesses** – The programs included within this element of the SWMP successfully serve to protect water quality and enhance the visual aesthetics of the community. Overall, the litter control and roadside maintenance efforts are effective in maintaining a visually pleasing environment for Huntsville’s citizens and for visitors. These efforts contribute to Huntsville’s reputation as a clean community with an excellent quality of life. The area is not litter free, however. Despite outstanding levels of garbage, trash and recycling material collection service (four pick-ups each week within the City- one for trash, one for recycleables, and two for garbage), illegal dumping of trash still occurs. Some people continue to throw trash into the drainage ditches and urban streams. Consequently, in spite of the substantial effort devoted to litter control, refuse continues to wash into the wetlands of Redstone Arsenal during heavy rain events via Huntsville Spring Branch. This ongoing problem spurred a joint project between the U. S. Corps of Engineers and the City of Huntsville to design a mechanical debris catcher to be constructed within the main channel of Huntsville Spring Branch just upstream of the Arsenal boundary. This device has not yet been constructed.

**f. Assessment of Controls** – See the preceding discussion on “Strengths and Weaknesses.” Largely as the result of the nature of the road repair work done by the City, there is very little potential for discharge of pollutants to the storm sewer system. Because of the limited need for applying deicing materials in north Alabama, it has been feasible to implement BMPs that virtually eliminate the exposure of these materials to storm water. Consequently, these components of this element of the SWMP are extremely effective. Similarly, the level of roadside vegetative maintenance provided by the City is outstanding. In fact, the City has assumed responsibility for maintaining several State ROWs within the City due to the enhanced level of treatment provided by the City relative to the level that can feasibly be provided by the Alabama Department of Transportation. This component is thus extremely effective. In contrast to these components of road and roadside maintenance, the litter control program is only partially effective. Despite substantial effort devoted to public education, litter removal and enforcement of littering ordinances, litter still enters the City’s drainage system and ultimately is discharged to waters of the State.

**g. Discussion of Proposed Revisions** – No revisions to this element of the SWMP are being proposed or are presently contemplated.

#### **4. FLOOD MANAGEMENT**

**a. Objective** – The objective of the City’s flood management program is to protect life and property. Within the context of the SWMP, this objective is harmonized with protection of water quality by reducing the discharge of pollutants from channel maintenance activities to the maximum extent practicable and coordinating all channel improvements and maintenance activities with the U. S. Army Corp of Engineers. For current and future development, the approach to flood management relies heavily on the requirements of the SWMM (Storm Water Management Manual) and the Flood Fringe Zoning Regulations to evaluate and prevent adverse impacts on flooding potential that could result from development. A number of activities that are currently underway in Huntsville are designed to reduce flood damage in areas of existing development. Among these are a comprehensive hydrological modeling effort to better evaluate flooding risks and more effectively allocate available resources for drainage improvements. The City has also established a long-term goal of removing existing structures from the floodways of Huntsville’s urban streams.

**b. Program Element Activities Completed** – The requirements of the SWMM and Zoning Regulations are being fully implemented. Similarly, stream channel maintenance activities necessary for flood control are being coordinated with the U. S. Army Corps of Engineers. Thus, these elements of the SWMP are already in place and are being fully implemented. At the time the first comprehensive narrative was submitted in March 2000, these were the principal elements of the SWMP that addressed flood control. However, since that time the City has adopted a more holistic and more sophisticated approach to flood management.

In response to the flooding of Aldridge Creek in 1999, the City Council established a Flood Mitigation Planning Committee in August 2000. The Committee consisted of City staff and citizens, and was supported by a Technical Advisory Committee with expertise in a range of technical areas germane to flood management. The Committee developed a comprehensive Flood Mitigation Plan, which was adopted by the Huntsville City Council in September 2001. A copy of this Plan is available on the Engineering Division's website at <http://services.hsvcity.com/Engineering/floodmitigation.html>. The Planning Committee was supplanted by the Flood Mitigation Committee (renamed the Surface Water Management Committee in 2003), which was tasked with overseeing implementation of the Plan and preparing annual reports on implementation progress. The Committee's Annual Reports for 2002, 2003 and 2004 are also available on the Engineering Division's website. A copy of the 2004 Annual Report is included as Appendix F, and the Reports for 2002 and 2003 were appended to previous MS4 NPDES Annual Reports.

In addition to establishment of the Flood Mitigation Planning Committee, the City hired a hydrologist and retained a flood management consultant to help guide development and implementation of the Flood Mitigation Plan. Progress in Plan implementation is discussed at length in each of the Surface Water Management Committee's Annual Reports, and won't be repeated in detail here. However, a few noteworthy accomplishments will serve to highlight the expanded emphasis of Huntsville's flood management efforts.

Development of hydrologic models for Huntsville's urban streams is identified as a high priority in the Flood Mitigation Plan, and substantial progress has been achieved in this area. The hydrologic model of Aldridge Creek has been completed and the model of Huntsville Spring Branch and its tributaries (Broglan Branch, Fagan Creek, Normal Branch, Dallas Branch and Pinhook Creek) is essentially complete. Models of Peevey Creek, Robinson Mill Creek and Big Cove Creek are nearly completed as well.

As part of the City's long-range flood mitigation strategy, the goal of removing structures from the floodways in Huntsville has been established. Following the flooding of Aldridge Creek in 1999, the City purchased and removed 34 homes from the Aldridge Creek floodway with the assistance of FEMA matching funds. Removal of these structures made it possible to make subsequent channel improvements under the auspices of a Corps of Engineers Dredge and Fill Permit. As a result of these actions, several hundred homes were removed from the flood hazard area and there are no longer any structures located in the Aldridge Creek floodway.

As a result of the systematic approach to flood management that has been adopted in Huntsville, and the progress made in implementing the Flood Mitigation Plan, FEMA (Federal Emergency Management Agency) improved Huntsville's Community Rating System designation from Class 8 to Class 7 during the past year, thereby reducing flood insurance rates for Huntsville property owners in flood prone areas.

**c. General Discussion** – The requirements of the SWMM and Flood Fringe Zoning Regulations are discussed in some detail in the sections of the Narrative dealing with Structural Controls and Planning Procedures. This discussion will not be repeated here. As emphasized in

these preceding sections, the principal objective of these elements of the program is to control flooding, but definite water quality benefits accrue from their implementation as well.

Flood control projects also include maintenance activity within the channels of the City's waterways to remove silt and vegetation which has accumulated or grown to the point that flow could be impeded. All such maintenance activity is coordinated with the U. S. Army Corps of Engineers and is conducted in accordance with maintenance permits issued by the Corps.

With establishment of the Surface Water Management Committee and adoption of the Flood Mitigation Plan, Huntsville has taken a more holistic approach to flood management. The Committee explicitly recognizes the interrelationship between flood control and surface water quality, and has identified natural resource protection as a goal of the Flood Mitigation Plan. The Plan promotes integration of flood control measures with in-stream habitat protection and improvement, and endorses the City's Open Space Plan as an integral part of the strategy to reduce flooding potential inside the City while concomitantly enhancing the aesthetic appeal and biodiversity of Huntsville's urban streams. Furthermore, this expanded vision of flood management in Huntsville has included areas of existing development. While the SWMM and Zoning Regulations provide protection for newly developed areas, the Flood Mitigation Plan includes all flood prone areas within the City. The addition of a full-time hydrologist to the Engineering staff, hydrologic modeling of the urban streams and removal of structures from the floodway are evidence of this broader vision that benefits areas of existing development.

**d. Compliance Status** – Huntsville is in compliance with these SWMP requirements.

**e. Strengths and Weaknesses** – The approach to flood management in newly developed areas is seen as a strength of Huntsville's program and serves to prevent flooding problems by limiting runoff rates. This approach is protective of water quality, particularly when viewed in conjunction with the erosion control provisions of Huntsville's SWMM. Thus, current City planning requirements have served to harmonize water quality concerns with the need to provide flood control. In contrast, in areas developed many years ago water quality was not a principal consideration in controlling flooding. There is consequently an ongoing tension between the need for flood control and water quality protection in these areas.

Historically, the integration of water quality concerns with flood control was not typically practiced. Rather, the increased rate of runoff resulting from urbanization was generally accommodated by channelization of urban streams to increase their capacity and by use of methods such as slope-paving to reduce the friction coefficient (thereby increasing flow velocity). This approach requires ongoing maintenance of the channel to maintain the ability to accommodate high flows. Even with the use of Best Management Practices in accordance with Corps requirements, this approach is not as protective of water quality as the current practices applied to new development. Huntsville implements the BMPs effectively, however, and their use limits the discharge of pollutants from channel maintenance. Nonetheless, the approach taken in areas of new development is more protective of water quality, as noted earlier.

For this reason, the City's approach to flood management was viewed as a programmatic strength with respect to new development at the time the last comprehensive narrative was submitted, but as a relative weakness in the context of existing development. Subsequent evolution of the City's flood management element of the SWMP has largely focused on addressing the deficiencies in areas of existing development. This remains the greater relative challenge in harmonizing water quality and flood protection goals, but substantial progress has been made in this area.

**f. Assessment of Controls** – As stated in the preceding discussion of strengths and weaknesses, the practices employed to limit pollutant discharges from new development are viewed as being more effective than incorporation of BMPs into channel maintenance work. This is an unavoidable consequence of historical approaches to flood control employed in areas developed many years ago. However, the recent and current efforts of the Surface Water Management Committee and the City's Engineering Division have served to integrate water quality protection and flood management in areas of existing development within the City. As discussed in the Surface Water Management Committee's 2004 Annual Report, restoration of urban stream habitat in long-developed areas of the City is a means of enhancing water quality and providing added flood protection in areas of redevelopment. The design of the Pinhook Creek Drainage Improvements in downtown Huntsville has recently been initiated, and will incorporate this approach.

**g. Discussion of Proposed Revisions** – There are no revisions being proposed at the present time. However, the requirements of the SWMM regarding retention facilities are still being evaluated, as noted in the preceding discussion on Structural Controls.

## 5. MUNICIPAL FACILITIES

**a. Objective** – The objective of this element is to ensure that storm water runoff from municipal landfills and other municipal waste treatment, storage and disposal facilities is adequately monitored. The only such facility in the City of Huntsville is the sanitary landfill, which is operated by the Solid Waste Disposal Authority (SWDA). The Authority has contracted with Ogden-Martin Systems to operate a Refuse-to-Energy plant as well, but this facility is located outside the City limits and is therefore outside Huntsville's jurisdiction.

**b. Program Element Activities Completed** – The SWDA sanitary landfill has been issued an NPDES permit by ADEM for their storm water discharge. Samples are collected and analyzed semi-annually in accordance with the Permit and the results of the monitoring are reported to ADEM on their Discharge Monitoring Reports (DMRs). Copies of the DMRs are routinely provided to the City's Natural Resources Division as a component of the monitoring portion of the SWMP.

**c. General Discussion** – As stated, monitoring of MSWL is conducted in accordance with EPA reference methods, and the results are routinely reported both to ADEM and Natural Resources. The landfill has consistently been in compliance with the terms of their NPDES

Permit, including applicable discharge limitations. Copies of the DMRs have been included in Huntsville's Annual Report each year. As noted above, the SWDA landfill is the only MSW TSD facility within the City limits of Huntsville.

**d. Compliance Status** – The City is in full compliance with this element of the SWMP.

**e. Strengths and Weaknesses** – The SWDA landfill satisfies the requirements of Subtitle D of RCRA for sanitary landfills. Active cells are equipped with liners and leachate collection systems, which have been proven effective in limiting the discharge of pollutants to storm water. The monitoring program for the landfill has served to effectively demonstrate compliance. There are no deficiencies in this element of the SWMP.

**f. Assessment of Controls** – As stated, the measures included in this element of the SWMP are fully effective in achieving the goal of minimizing pollutant discharges in the runoff from the MSWL to the “Maximum Extent Practicable.”

**g. Discussion of Proposed Revisions** – No revisions to this element of the SWMP are being proposed or contemplated.

## **6. PESTICIDES, HERBICIDES AND FERTILIZERS**

**a. Objective** – Alabama State law preempts municipal authority to regulate pesticides. More specifically, “No county, municipal corporation, or other political subdivision of this state shall adopt or continue in effect any ordinance, rule, regulation, or resolution regulating the use, sale, distribution, storage, transportation, disposal, formulation, labeling, registration, manufacture, or application of pesticides.” (ALA CODE § 2-27-5.1). This provision of state law of necessity drastically limits the objectives of this element of the SWMP. SWMP activities related to pesticides are consequently confined to public education and to the use of BMPs by City agencies.

**b. Program Element Activities Completed** – The activities discussed below are being implemented at the present time.

**c. General Discussion** – Wherever practicable, the City utilizes mechanical methods of vegetation maintenance, i.e. mowing, bush hogging, weed eating, etc., to limit the amount of pesticide application. This is done for several reasons, including aesthetic appeal, erosion control and water quality protection. Statistics on the acreage of ditch bank, roadside ROW and public lands mowed and trimmed on an annual basis are included in each Annual Report. In cases where pesticide use is required, certified technicians apply the material. The number of certified pesticide applicators employed within the City's Landscape Management Division is also included in the information provided in each Annual Report.

***Pesticide Storage*** – A number of years ago, the City's Natural Resources Division conducted a comprehensive evaluation of pesticide storage practices at the request of the Director of Public

Services (which included Public Works Operations, Landscape Management and Recreation Services at the time). The largest quantities, and widest variety of pesticides were used and stored by the municipal golf courses located at the Jetport and on Memorial Parkway just south of Airport Road. A number of improvements in storage practices, and implementation of additional spill control BMPs were implemented in response to Natural Resources' recommendations. At present, the City does not operate either of these courses, however, and both the quantity and variety of pesticides used by the City has decreased accordingly.

Pesticide storage areas presently include the Landscape Management Operations facility located on Newby Road. This facility was evaluated by Natural Resources at the time of the golf course storage area evaluations and BMPs were determined to be generally adequate. Only minor changes were recommended. However, additional herbicide storage areas have been provided since Natural Resources performed the evaluations in 1994. Storage of herbicides used in drainage easement maintenance is provided in the Public Works Operations building in a room specifically designed for pesticide storage. Pesticides used to control weeds and grubs are also stored in a Recreation Services facility for use at the City parks in the northern part of the City (on Lodge Road). Pesticides are stored inside a block building that provides adequate containment, in a well-ventilated area dedicated for chemical storage. Finally, small amounts of pesticides are used horticulturally at the City greenhouse, and on-site storage of these materials is provided.

***Pesticide Application*** – As noted previously, the City limits the use of pesticides whenever possible for a variety of reasons, including water quality protection. Mechanical methods are used as the preferred means of vegetation control and maintenance. In areas where problems with equipment access or the topography precludes the use of mechanical methods, herbicides are used however. Of greatest interest from a water quality standpoint are those application practices utilized in drainage area ROWs.

Along drainage easements, two herbicides are used. On flat areas alongside the top of ditch banks, Roundup is used. Along sloped areas, where pesticide runoff could conceivably enter the water, the herbicide Rodeo is used. Rodeo was selected for this application precisely because of its exceptionally low toxicity to a variety of aquatic life forms. Even though neither of these herbicides is a restricted use pesticide, both herbicides are applied only by certified technicians. This serves to ensure that all pesticides are applied in strict accordance with label instructions and pesticide applications are only made under appropriate environmental conditions (e.g. low wind speed).

A wider variety of pesticides are utilized on ball fields due to the more demanding turf maintenance requirements for athletic fields, as well as the wider varieties of pests that can become problematic in areas equipped with irrigation systems due to the moister soil conditions that prevail. Again only certified applicators are authorized to spray pesticides on City athletic fields and parks.

The use of certified applicators also provides assurance that proper disposal practices are employed and that label instructions are strictly followed. Triple rinsing of containers and application of the rinsate to the area being treated is the relevant Best Management Practice.

**d. Compliance Status** – The City is presently in full compliance with this element of the SWMP.

**e. Strengths and Weaknesses** – The most salient weakness of this element of the City of Huntsville SWMP is the limited authority of the City to control pesticide storage, use and disposal. As noted above, Alabama law precludes local regulation of pesticides, thereby limiting the City’s ability to control pesticide related pollutant discharges to those activities conducted by the City itself. Although in practice this has not been a problem, the City would seemingly be powerless to take action in the event it becomes a problem. If storm water quality problems resulted from improper storage, use or disposal of pesticides in the City of Huntsville, the only relief available would result from an appeal to the state Department of Agriculture and Industry and to ADEM.

In contrast to the City’s inability to effectively control pesticide application by the private sector, Huntsville has been very effective in implementing internal procedures to minimize water quality impacts resulting from the City’s storage and use of pesticides. As noted above, BMPs involve spill prevention in storage, use minimization, employee training for applicators, and careful selection of herbicides to minimize any potential adverse water quality impact.

**Public education** – The City of Huntsville has not expended appreciable effort on educating the public on the proper use of pesticides. In other words, there is not a concerted public outreach effort in this area. There is one statement on the Natural Resources home page (under the “Voluntary Actions to Reduce Pollution” section) encouraging citizens to carefully observe all label instructions in the use of pesticides, but this hardly qualifies as a concerted public education campaign. More specific information on particular pesticides has been obtained by Natural Resources and provided to citizens requesting the information, but this has tended to focus more on health and environmental effects than on proper use of the material. The Cooperative Extension Service and the Department of Agriculture and Industry are viewed as better sources of public information on selection and use of specific pesticides.

In contrast to very limited efforts regarding public outreach on proper use of pesticides, the City has given substantial emphasis to educating the public on proper disposal. This has primarily been effected through public education regarding the Household Hazardous Waste Disposal program, which is discussed in greater detail in a subsequent section of this Narrative.

**f. Assessment of Controls** – Within the constraints of Alabama law, Huntsville is limiting water quality impacts from pesticides to the maximum extent practicable.

**g. Discussion of Proposed Revisions** – No changes to current practices are being proposed or are presently being contemplated.

## **7. ILLICIT DISCHARGE INSPECTION/INVESTIGATION/ENFORCEMENT, INCLUDING I/I SANITARY SEWER SEEPAGE, SSOs OR BYPASSES**

**a. Objective** – The objective of the illicit discharge investigation program is to identify and eliminate the intentional discharge of pollutants to the MS4 by any person, and identify and correct improper waste handling practices or material storage practices that contribute pollutants to the storm sewer system. These efforts are directed primarily toward protecting surface water aesthetics and the biota of the receiving stream. The ongoing program to identify and eliminate sources of infiltration and inflow into the sanitary sewer system, thereby reducing the potential for overflows and bypasses, provides important public health benefits as well as lotic ecosystem protection.

**b. Program Element Activities Completed** – Historically, the City of Huntsville pretreatment program staff took the lead role in illicit discharge investigation. However, with the advent of the NPDES Phase I storm water requirements, the Natural Resources and Environmental Management Division assumed progressively more responsibility for elimination of illicit discharges to the MS4. With adoption of Huntsville’s storm water quality ordinance in early 1998, additional enforcement authority was explicitly conferred on DNR to enforce the illicit discharge prohibitions.

The prevention, identification and elimination of illicit discharges actually involves several City agencies, and is closely related to several other SWMP elements discussed in this narrative. The interrelationship of these various program elements is clarified in the ensuing general discussion. Although, illicit discharge prevention, investigation, and elimination are ongoing efforts, the programmatic resources and requisite legal authority to effectively implement the program are all in place. Similarly, controlling infiltration and inflow is a constant effort by the Water Pollution Control Department, and the work is never actually completed. However, a program of ongoing sewer maintenance and repair is in place, and a massive multi-year effort to rehabilitate the sanitary sewer system was implemented in the 1990’s, funded primarily by the State Revolving Fund. The total cost of sewer rehabilitation projects performed under contract was over \$13,000,000. Inclusion of capital funds expended on the City’s existing wastewater treatment facilities would yield a total capital investment of many times that total over the past 10 years. The Water Pollution Control Division is currently drafting a plan to implement the CMOM (Capacity, Management, Operations, and Maintenance) program in Huntsville, and the City Council has adopted a sewer rate increase to fund additional system rehabilitation work associated with this effort. Anticipated expenditures over the next decade for sewer system rehabilitation is in excess of \$50,000,000.

### **c. General Discussion –**

*Illicit Discharge Prevention* - The importance of effective development and construction planning procedures, and effective inspection procedures to ensure compliance, is paramount in preventing new sources of illicit discharges to the MS4. The planning and construction planning procedures ensure that commercial and industrial facilities provide for proper wastewater

disposal and incorporate appropriate spill control BMPs into the design of material storage and handling areas. Similarly, enforcement of the plumbing code by City inspectors ensures that illicit waste disposal connections to the storm sewer (or conversely the illicit connection of storm water and foundation drains to the sanitary sewer) are not allowed. Due to the effectiveness of these elements of the City of Huntsville SWMP (see relevant sections of this narrative), new illicit discharges originating from construction or renovation of facilities is extremely unlikely.

*Elimination of Previously Installed Illicit Connections* - Although the planning and inspection elements of the SWMP effectively preclude the addition of illicit connections during construction, these safeguards do not address illicit connections that were provided during construction many years ago. These connections could have been made illegally many years ago, when municipal planning and inspection procedures were far less rigorous than they are today, or could reflect what was considered acceptable practice at the time of construction. These types of illicit connections are probably less of a problem in Huntsville, which is a relatively young city, than in older municipalities across the country. Huntsville was a small town prior to the 1950's. Consequently, most of the building and infrastructure development of Huntsville has taken place relatively recently.

In the early 1980's, Water Pollution Control initiated a concerted effort to eliminate storm water and cooling water discharges to the sanitary sewer. This effort resulted in redirection of a number of industrial cooling water discharges to the storm sewer or to the surface. The number of storm water inflow sources identified was small, however. Several illicit discharges to the MS4 from floor drains and oil separators at full service filling stations were identified by Water Pollution Control in the late 1980's. These discharges were redirected to the sanitary sewer. Again, the number of illicit discharges identified at this time was small, and each of these situations was corrected. More recently, Natural Resources required several dry cleaning facilities that were discharging the blow-down from their small boilers to the surface to redirect these discharges to the sanitary sewer. These examples suggest that illicit connections to the storm sewer are not a pervasive problem in the City of Huntsville, probably for the reasons outlined above. Furthermore, these examples demonstrate that Huntsville had been addressing the problem of illicit discharges for a number of years prior to promulgation of the NPDES regulations governing MS4 discharges.

*Elimination of New Illicit Discharges* – Although the construction planning and inspection elements of the SWMP are very effective in preventing new illicit discharges, there have been occasions over the past few years in which action had to be taken to eliminate such discharges. These have primarily involved automobile detail shops, but discharges from a company that manufactures concrete landscaping features and another that manufactures marble counter tops have also been addressed. In each of these cases, a business moved into an existing commercial facility and did not renovate the structure. Consequently, they were not required to obtain a building permit and they “fell through the cracks.” In each case, Natural Resources has required that appropriate preliminary treatment be provided (grit chambers and oil separators, as appropriate), and the discharge has been redirected to the sanitary sewer. Formal enforcement action has only been required in one of these cases to compel compliance.

*Enforcement of Illegal Dumping Prohibition* – In addition to the continuous, or intermittent illicit discharges resulting from illicit connections to the MS4, there are occasional instances of illegal dumping to the storm sewer system. The most common form of illegal dumping is by individual citizens rather than by commercial or industrial facilities, and the most common problem is the discharge of automotive fluids (primarily used crankcase oil) by “do-it-yourselfers.” Natural Resources responds to these violations in response to complaints provided by the community. Residents who have poured oil into the storm sewer are given a warning and provided with information on the curb-side used oil collection program. There have been relatively few such incidents (a review of the complaint investigation reports provided with each Annual Report will verify this assertion), and there have been no repeat offenses. If a repeat offense ever occurs, the individual will be issued a citation to appear in Municipal Court. In addition to the instances of illegal dumping by individuals, there have been occasional complaints regarding dumping by commercial entities.

In June 2000, Natural Resources received two complaints involving the illicit discharge of carpet cleaning wastewater to the Municipal Separate Storm Sewer System (MS4). During the course of investigating these complaints it became apparent that this was common practice by persons engaged in the carpet cleaning business. Consequently, Natural Resources initiated an effort to educate the community regarding proper waste disposal alternatives. Twenty-five carpet cleaning businesses were identified from the telephone directory and each was sent a letter explaining the provisions of the Storm Water Quality Ordinance. In addition, each company was asked to complete a survey providing information on waste generation rates, disposal practices and the types of cleaning chemicals utilized. After a series of follow-up actions, most of the surveys were completed and returned. Of twenty companies that provided the requested information, 10 were engaging in improper wastewater disposal. Natural Resources reviewed the suitability of the cleaning chemicals for discharge to the sanitary sewer and provided each company with an individualized response regarding the proper disposal of carpet cleaning wastewater. At the conclusion of this initiative in October 2000, all facilities were sent a letter outlining the results of the investigation and reiterating the requirements of the Storm Water Quality Ordinance. Those who had never responded to the survey were again advised that the discharge of wastewater to the surface of the ground or to the storm sewer system is in violation of the ordinance, as well as the Clean Water Act, and will subject the violator to enforcement action.

There have been occasional investigations involving the dumping of paint-laden wastewater to the MS4 by painting contractors cleaning their brushes, rollers and/or spray equipment. Although Natural Resources has responded to each such complaint, it hasn't always been possible to identify the source of the discharge. In a few instances, there was insufficient evidence to issue a citation. Several warnings have been issued, however, and one painting contractor was recently issued a citation for dumping paint waste to the MS4. He was subsequently convicted in Municipal Court and fined.

*Control of Infiltration/Inflow and Elimination of Sanitary Sewer Overflows* - The City of Huntsville has had an ongoing program to reduce the infiltration and inflow entering the sanitary sewer system for many years. This program has been managed in-house and the work has been

conducted by the sewer maintenance division of the City. In spite of this effort, there was a gradual increase in I/I from the mid-1970's through the early 1990's, with a resultant gradual increase in sanitary sewer overflow events. To address this problem and reverse this disturbing trend, the City began an aggressive program to eliminate sanitary sewer overflows and remove Infiltration/Inflow (I/I) from the sanitary sewer in the early 1990's. The initial phase of this massive effort entailed completion of a Sanitary Sewer Evaluation Study SSES in 1992 to characterize the extent of the problem and direct resources towards the most cost-effective solutions.

The Spring Branch and Aldridge Creek collection systems were broken into mini-basins, flows were monitored and ranked according to amount of excessive Infiltration/Inflow. Projects were then designed and bid for the rehabilitation of these mini-basins. During the period of June 1995 through 2000, the City bid seven separate rehabilitation projects, totaling over \$13 million, to address I/I concerns and overflows. The final phase of this rehabilitation work was specifically designed to address areas with known overflows that did not necessarily have extensive I/I problems. Also included in this effort was the complete GPS mapping of the collection system, including invert elevations, to facilitate modeling of problem areas.

Post-rehabilitation flow monitoring of the areas involved in rehabilitation showed mixed results. This is probably attributable to the fact that more sewage is being retained within the collection system during wet weather events. In other words, the historical flow information did not include that portion of the flow that was bypassed or had overflowed, whereas the post-rehabilitation flows included virtually all of the flow entering the system. Another project that has helped eliminate overflows is the addition of a parallel outfall line in the Western Area collection system. Although this project wasn't specifically designed for I/I removal, it has had the effect of removing an overflow problem in at least one subdivision.

This monumental rehabilitation effort was performed under contract and funded through the SRF (State Revolving Fund) Program. Progress in completing the work has been described in the storm water Annual Reports for fiscal years 1996-98. Information included in the Annual Reports included the amount of money expended, the linear feet of sanitary sewer slip-lined or replaced, the vertical feet of manhole rehabilitation, etc. Subsequent to completion of this sewer rehabilitation effort, in-house identification and elimination of extraneous flows resumed. As described in the comprehensive narrative included in the Annual Report for 1999, an ongoing program of flow monitoring at a number of points in the collection system has been implemented, and the Technical Services Division of Water Pollution Control is now explicitly charged with the responsibility of conducting ongoing I/I investigation and for prioritizing the work performed by the sewer maintenance crews. Technical Services has one full-time employee devoted to I/I evaluation, and this same individual provides direction to the Television Inspection (TVI) crew in the sewer division. In addition to the individual explicitly charged with I/I evaluation, Technical Services draws upon other staff members to assist with flow studies and other aspects of the fieldwork. Small repair projects will continue to be done in-house, whereas any necessary major repairs continue to be performed as capital projects under contract.

The City of Huntsville has made significant progress in addressing SSO's as the result of the substantial capital expenditures for sewer rehabilitation over the past 10 years, and the increased in-house capability to evaluate and correct I/I problems. However, with the emphasis EPA Region 4 has placed on reducing SSO's in recent years, and development of the CMOM (Capacity Management, Operations, and Maintenance) Program by the City's Water Pollution Control Department, a substantial increase in the resources allocated to eliminating and preventing SSO's is anticipated. At the present time, WPC is preparing a self-assessment for submittal to ADEM and EPA Region 4. This self-assessment is to include a detailed evaluation of the management, operations and maintenance programs being implemented by WPC to reduce SSO's, as well as a history of system performance, a description of proposed program improvements, and a schedule of proposed sewer rehabilitation projects. As noted previously, the City Council recently approved a sewer rate increase to fund this rehabilitation work, which has been estimated to cost in excess of \$50,000,000 over the next decade.

**d. Compliance Status** – Huntsville is in compliance with the requirements of this element of the SWMP.

**e. Strengths and Weaknesses** – One of the strengths of this program element is the long history of controlling illicit discharges to the MS4. Huntsville has been requiring spill control BMPs at commercial and industrial facilities for many years. Alternatives to illegal disposal of oil and waste have been available to the general public for a number of years. The plumbing code has been enforced for many years. For all of these reasons, as well as the historical pattern of development described previously, illicit discharges to the MS4 are relatively uncommon in Huntsville.

In cases where illicit discharges do occur, Huntsville has the technical staff and investigative capability to identify the source of the discharge and formulate appropriate corrective action. Adequate enforcement authority is in place to compel compliance in those extremely rare cases where identified problems are not voluntarily corrected. Thus, prevention, identification and elimination of illicit discharges are all strong aspects of this program element.

With respect to Sanitary Sewer Overflows, and the ongoing program to control Infiltration and Inflow, Huntsville has made substantial progress over the past 10 years, as evidenced by the large capital expenditures for sewer system rehabilitation projects and the enhanced in-house capability to evaluate and eliminate I/I and resultant SSO's. Although the benefit of these efforts will be reflected in the CMOM self-assessment, the City expects to devote substantially greater resources to sewer system maintenance and rehabilitation in the coming years. Huntsville recently raised sewer rates to ensure sufficient funding is available to do so.

**f. Assessment of Controls** – As underscored in the preceding discussion, this program element is viewed as being extremely effective.

**g. Discussion of Proposed Revisions** – No revisions to this program element are currently being proposed or are presently contemplated.

## 8. SPILLS

**a. Objective** – The purpose of the City’s spill response program is to protect life and property and to minimize adverse environmental impact from the accidental release of hazardous materials.

**b. Program Element Activities Completed** – The City of Huntsville established a Hazardous Materials Emergency Response Unit within Huntsville Fire Department in 1988. One year earlier, in 1987, Huntsville took the lead role in establishing the Local Emergency Planning Committee (LEPC) in response to passage of the Superfund Amendments and Reauthorization Act (SARA). The Huntsville-Madison County Emergency Management Agency (EMA) remains the lead agency, or the “focal point” of the LEPC. Facilities within Huntsville that store Extremely Hazardous Substances have developed and implemented Uniform Emergency Response Plans, pursuant to SARA requirements, and routinely provide updated plans to EMA.

**c. General Discussion** – Title III of SARA required local governments to undertake a comprehensive planning process to ensure effective local response to hazardous material releases. The LEPC was formed to address that challenge and assembled members from the Fire Department, Police Department, Emergency Management, Water Pollution Control, Natural Resources, the County Commission, the City Council, the media and the local industrial community. Around the same time, a coalition of local industrial representatives formed CAER (Community Awareness and Emergency Response). The organization was established to promote environmental awareness and compliance among its members, facilitate coordination of the community emergency response planning process, serve as an industrial liaison to the LEPC, and provide information to the general public regarding hazardous materials and emergency response. Both the LEPC and CAER have remained active since their inception and continue to meet regularly.

In 1988, at the time the Haz-Mat unit was established, Standard Operating Procedures were developed by the Emergency Management Agency to delineate responsibilities in the event of a hazardous materials release. The procedures are referred to as Haz-1 and Haz-2. Haz-1 addresses accidental release of hazardous materials, whereas Haz-2 concerns the discovery of hazardous materials that were dumped or deposited on property within the City. Copies of these SOPs were included in the 1999 MS4 NPDES Annual Report for reference.

The Haz-Mat team is equipped with a hazardous materials response vehicle. This vehicle has a computer, with appropriate software (e.g. Cameo) to model dispersion of chemicals. The unit is also equipped with a generator, personal protective equipment, toxic gas meters for specific chemical identification, booms and absorbent material, cylinder repair kits and other equipment and supplies for use in hazardous material response. There is a comprehensive program of on-going training for Haz-Mat team members. All are trained at the HAZWOPER Technician level and each team member attends the annual refreshers necessary to maintain this level of training.

In addition to the response capability provided by the Haz-Mat unit, a number of industrial facilities have internal spill response teams that focus on the unique characteristics of their individual facilities. This allows an immediate response to a fixed-facility incident and provides immediately available equipment and supplies. It also allows for specialized training in handling the hazardous materials present at a particular facility, and provides detailed knowledge and information on the storage locations of chemicals, the locations and quantities of response equipment and the layout of the facility. Each facility UERP (Unified Emergency Response Plan) includes a description of the facility's response capability, chemical quantities and locations, information on utilities, and an inventory of response equipment and supplies. The Haz-Mat team has copies of the Tier II Chemical Inventory Reports and also has access to the UERPs, thus ensuring coordination of response efforts and effective use of available resources.

Over the years, with continued enhancements to equipment and the increase in experience of the unit, the effectiveness of the Haz-Mat team has continued to increase. This trend has accelerated in recent years with the strong federal emphasis on Homeland Security, and increased federal support has allowed additional investments in emergency response equipment and personnel training. At one time, the Fire Department relied heavily on Water Pollution Control and Natural Resources personnel to provide technical support on chemical properties and appropriate response measures during hazardous materials incidents. Although this support is still available to the Haz-Mat team, it has only rarely been requested over the past several years. This is probably a reflection of the increased expertise of the Haz-Mat team, as well as the nature of the incidents.

**d. Compliance Status** – Huntsville is in full compliance with this element of the SWMP.

**e. Strengths and Weaknesses** – The high caliber of the Haz-Mat team personnel and the high level of training are strengths of the City's spill response capability. Similarly, the fact that the unit is well equipped is a program element strength. The outstanding cooperation of the industrial community, and the response capabilities developed by facilities that use or store hazardous materials are also strengths of this element of the SWMP. There are no perceived weaknesses in this program element.

**f. Assessment of Controls** – As suggested by the preceding discussion, this program element is highly effective in meeting its stated objectives.

**g. Discussion of Proposed Revisions** – No changes to this program element are being proposed or are contemplated at the present time.

## **9. OIL AND HOUSEHOLD HAZARDOUS WASTE**

**a. Objective** – The Solid Waste Disposal Authority of the City of Huntsville (SWDA) has implemented a comprehensive program to facilitate the proper handling and disposal of used oil and household hazardous waste. The objective of the program is to separate materials which

could adversely impact the environment from the municipal solid waste stream, promote recycling of useful materials (particularly used oil and batteries), and to protect sanitation workers and solid waste disposal facility personnel from exposure to potentially harmful chemicals.

**b. Program Element Activities Completed** – The weekly curbside collection of used oil has been in place in all parts of the City of Huntsville for a number of years and is being fully implemented. Similarly, the household hazardous waste collection program has matured and is being fully implemented, as described in the general discussion below. The SWDA tracks the amount of material collected and these statistics are provided to ADEM each year in the Annual Report. Based on the relatively constant annual totals for used oil collected (20,000 to 22,000 gallons in each year from 1996 through 2004), this component of the program seems to be fully mature. In contrast, the volume of household hazardous waste has gradually increased from 14,600 gallons in 1996 to 22,000 gallons in 2004. The number of citizens utilizing the service has also increased over the years (from roughly 2000 households in 1996 to over 3000 in 2004). The program was expanded in 2003 when the SWDA obtained approval from ADEM to allow CESQG's (Conditionally Exempt Small Quantity Generators) to participate. To date, relatively few qualifying commercial facilities have opted to participate. Nonetheless, this expansion in the scope of the HHW collection program may fuel continued increases in the volume of material collected by the SWDA, and thereby removed from the solid waste streams destined for the Refuse-to-Energy Plant and the MSWLF.

**c. General Discussion** – As alluded to above, used oil collection is provided as a component of the curbside recycling program in the City of Huntsville. The SWDA has contracted with BFI to provide the collection service. The trucks utilized by BFI are equipped with a tank for holding used oil. Residents may place used oil in a capped gallon milk jug and set it beside their “blue bin” for pick-up. There is no additional charge for this service.

Household hazardous waste (paints, cleaning solvents, automotive products, old fuel, etc.) may be brought to the household hazardous waste collection center, located at the SWDA sanitary landfill, on the first Saturday of each month from 8:00 AM to 12:00 Noon. A state-of-the-art temporary storage facility with compartmentalized, fully contained areas for safe storage of incompatible wastes is utilized to house the material pending pick-up by a licensed hazardous waste transporter. This facility is designated the “The Handle With Care Household Hazardous Waste Collection Center.” As noted above, the scope of the service was expanded in 2003 to allow delivery of CESQG (Conditionally Exempt Small Quantity Generator) waste to the collection facility. The Authority routinely conducts public outreach via the broadcast and print media to promote awareness of the service. These efforts include monthly publication of a conspicuous advertisement in the Huntsville Times. A copy of the monthly newspaper advertisement is included in this Annual Report. As is true of the used oil collection service, and the “blue bin” recyclable material collection service, there is no additional charge for utilization of the household hazardous waste collection center services.

**d. Compliance Status** – The SWDA has successfully implemented a model recycling program and continues to provide an outstanding level of integrated solid waste management for the City of Huntsville. The used oil and household hazardous waste collection components of solid waste management in Huntsville fully satisfy both the intent and the letter of the MS4 NPDES Permit and the underlying regulations codified in 40 CFR Part 122.

**e. Strengths and Weaknesses** – Among the strengths of this element are the accessibility to the public and the ease with which these services can be utilized. Inclusion of the used oil collection program with weekly curbside recycling pick-up has made proper disposal of used oil virtually effortless. It's as easy to set the jug of used oil beside the blue bin as it is to pour it down the storm sewer. Although the household hazardous waste collection program is not quite as convenient for citizens, there are important reasons for this, including safety issues related to material compatibility and the prudent desire to minimize the time of storage of the material. As it is being implemented, residents bring the material to the center in the morning of the first Saturday, and it is picked up by a licensed hazardous waste transporter shortly thereafter. Given the safety and environmental constraints inherent in handling HHW, the maximum amount of convenience practicable has been provided.

In spite of continued efforts to inform the public of the program, in all probability there are many residents who are unaware of the service. Natural Resources still receives calls from citizens seeking guidance on disposal of HHW, but the frequency of such calls has diminished somewhat in recent years. Presumably, the SWDA receives similar calls. Although the program has now been in place for a number of years, the number of residents utilizing the service has continued to grow over time, albeit at a modest rate. This fact implies that additional people are still learning about the service and that public outreach should continue. Although some increase in the volume of HHW handled annually might be expected as the result of population growth alone, the relative constancy in the amount of used oil collected supports the conclusion that the increase in HHW volume is at least partially attributable to increased public awareness.

**f. Assessment of Controls** – The program has been very successful, based on the direct feedback provided by the annual volumes of used oil and HHW collected and recycled or properly disposed of. There is no way to directly quantify the amount of material that has been diverted from disposal via illicit discharge to the storm sewer system. Much of the material collected would probably have been mixed with household trash if these services were not available. However, these programs have certainly served to reduce the amount of material disposed of improperly.

**g. Discussion of Proposed Revisions** – The program is successfully accomplishing its objectives and no changes are presently contemplated. However, the SWDA anticipates increased utilization of the program by CESQG's in the coming years.

## **10. INDUSTRIAL INSPECTIONS**

**a. Objective** – To ensure that appropriate BMPs are in place and are being effectively implemented to prevent the discharge of pollutants to the MS4 from sites of industrial activity.

**b. Program Element Activities Completed** – Annual inspections of area industries are conducted by Natural Resources personnel using standardized inspection procedures. Additional industrial inspections are performed by Water Pollution Control Division pretreatment program personnel. These inspection activities are being performed and the facilities inspected during each fiscal year are identified in the Annual Report. In addition, copies of the inspection reports completed in conjunction with these activities are kept in facility files at the Natural Resources office. Finally, a tentative list of industrial facilities scheduled for inspection during the upcoming fiscal year is also provided to ADEM as a component of the MS4 NPDES Annual Report. Thus, the activities constituting this SWMP element are being fully implemented.

**c. General Discussion** – The City of Huntsville was the first municipality in the state of Alabama to implement a pretreatment program. This was done in the 1960's, prior to passage of the Federal Clean Water Act or the Alabama Water Pollution Control Act. Similarly, the City of Huntsville established a local air pollution control program in 1964, well in advance of passage of the Federal Clean Air Act or the Alabama Air Pollution Control Act of 1971. Thus, Huntsville has a long history of proactive environmental protection and is the only municipality in Alabama authorized under state law to implement the Clean Air Act. Both the pretreatment program and the air pollution control program have continued to develop and evolve in response to the changing regulatory milieu and shifting needs of the local community.

A strong pretreatment program and employment of a cadre of environmental professionals in the air program served as significant advantages in facing the challenge of integrating industrial storm water compliance inspections into Huntsville's overall SWMP. In order to effectively implement this element of the program, additional legal authority was desirable and additional training had to be provided for air program personnel who were not familiar with storm water BMPs. Nevertheless, the transition was relatively smooth.

Preexistent legal authority may have been adequate, but relied on general provisions of the sewer use ordinance pertaining to spill control requirements and broad prohibitions against unsanitary methods of discharge. Furthermore, the inspection and enforcement authorities conferred on Water Pollution Control and Natural Resources personnel did not accurately reflect the actual roles of the two divisions in implementing the SWMP. These weaknesses in legal authority were remedied by passage of a storm water quality ordinance in 1998. (Comment on the ordinance was solicited from ADEM during the public comment period, and a copy of the adopted ordinance was included in the Annual Report for FY '97. The text of the ordinance and a "Fact Sheet" may also be accessed on the Natural Resources web page at [www.ci.huntsville.al.us/NatRes/](http://www.ci.huntsville.al.us/NatRes/)).

Training of Natural Resources personnel was provided by the Division Director, who had managed the City's pretreatment program for several years. The training was "hands-on." The Director accompanied Environmental Specialists on industrial inspections, pointing out spill prevention BMPs, identifying deficiencies, and evaluating potential sources of discharge, industrial wastewater treatment technologies employed, etc. Standardized inspection forms were developed to promote the use of consistent inspection methods and to serve as a reminder of

things to look for. (This worked out so well, analogous standardized inspection forms were developed for use in conducting air pollution control compliance inspections). This period of training was followed by a series of joint inspections between Water Pollution Control and Natural Resources to further promote consistency and share available knowledge.

Industrial inspections include a records review for those facilities which hold a NPDES storm water permit (compliance with a NPDES permit issued by ADEM constitutes compliance with the City's ordinance to avoid unnecessary, and potentially counterproductive duplicative regulation). Evaluations of structural BMPs, such as raw material containment structures, waste storage areas, fuel tank farm containment and roofs over material storage piles are performed as standard inspection components. Non-structural BMPs, such as routine inspection of storage areas, waste handling practices, housekeeping procedures and in-house spill response capabilities are also reviewed and evaluated. Copies of individual inspection reports are on file in the Natural Resources office and can be referenced for further detail on the standardized inspection procedures employed.

**d. Compliance Status** – The City of Huntsville is in full compliance with this element of the SWMP.

**e. Strengths and Weaknesses** – The program of industrial inspection is viewed as a singularly strong element of the overall City of Huntsville SWMP. The nature of the industrial community in Huntsville inherently limits the potential for storm water contamination in the area. Huntsville has a reputation as a clean city that has fostered and catered to the development of high technology industry with relatively low pollution potential. This is reflected in zoning requirements as well as the recruitment efforts of the Chamber of Commerce. Overlaid on this backdrop is a long history of local environmental regulation and a strong local environmental regulatory infrastructure. All of these factors contribute to the strength of the SWMP element. There are no evident weaknesses in the industrial inspection program.

**f. Assessment of Controls** – This program element is extremely effective, as discussed above.

**g. Discussion of Proposed Revisions** – No revisions to this element of the SWMP are presently being proposed or are currently being contemplated.

## **11. CONSTRUCTION PLANNING PROCEDURES**

**a. Objective** – Construction planning procedures are designed to ensure compliance with City requirements such as setbacks, landscaping requirements, and local building codes, as well as to ensure that infrastructure improvements conform to City engineering standards. In addition, the construction planning process serves to provide clarity to developers and contractors regarding what is required in order to avoid problems during the actual construction.

**b. Program Element Activities Completed** – The City of Huntsville has had a construction permitting program in place for many years, implemented by the Inspection Department. The City of Huntsville also requires that a construction permit be obtained from the City Engineering Division prior to initiating construction of public facilities. Construction contracts for road improvements, drainage projects, sanitary sewer installation, and other public infrastructure improvements are managed by the City’s Engineering Department. The City’s Facilities Project Management Division is responsible for managing contracts for construction of City buildings and recreational facilities.

**c. General Discussion** – Much of the construction planning process is closely interwoven with development planning procedures. This should be clear from a review of the Development Planning Procedures section of this narrative (see the preceding discussion). Discussion of these aspects of construction planning will not be repeated here.

Building permits are required to erect, enlarge, renovate, or demolish any structure. Building permits are issued by the City Inspection Department. Separate permits are required for electrical service installations. Mechanical and or/Gas permits are required for installation or replacement of mechanical systems in structures, and Plumbing permits are required for installation of water service, or installation of sewer service and related appurtenances. Detailed plans for each structure are reviewed by the Inspection Department for compliance with the building code and the zoning regulations. Other City agencies review the plans, or portions of the plans, as appropriate. Agencies which may be involved include the Health Department, the Fire Marshall’s office, Engineering, and occasionally Natural Resources. Involvement of agencies other than the Inspection Department is relevant to commercial and industrial facilities rather than single family residential premises.

Other than small projects that can be done in-house, public infrastructure improvements are done under contract. The City Engineering Department is responsible for managing City contracts for road improvements, drainage projects, sanitary sewer installation and sidewalk construction. For larger projects, preparation of plans and specifications is typically done by consulting engineers. A pre-bid meeting is generally held for contractors interested in bidding on the project in order to clarify requirements of the contract. The contract is awarded to the lowest bidder meeting all specifications. Construction permits issued by the Engineering Division are required for construction of public works infrastructure improvements such as streets, drainage, sanitary sewer, and sidewalks. Before any Construction Permit is issued, the Engineering Division holds a pre-construction meeting with all parties involved to discuss the scope of work, construction plans and specs, inspection requirements, schedules, erosion and sedimentation control plans, and other details of construction.

Construction of City buildings and recreational facilities follows a process similar to that utilized for infrastructure improvements. These contracts are managed by the Facilities Project Management Division.

**d. Compliance Status** – The City is in compliance with this element of the SWMP.

**e. Strengths and Weaknesses** – The City of Huntsville effectively enforces zoning requirements and the requirements of the southern building code. [**Note:** The City Council adopted the International Building Code in March 2005, shortly before final review of this Narrative.] Similarly, Huntsville effectively ensures that public facilities and infrastructure improvements are constructed in accordance with City engineering standards. City inspectors, both from the Inspection Division and from the Engineering Division, have the authority to issue Stop Work orders if work is being conducted without the proper permits, or fails to meet City specifications and requirements. This serves to protect the public from the effects of shoddy construction and helps ensure that public facilities are not inordinately expensive to maintain.

The criticisms of the City’s construction planning procedures are similar to those leveled against the development approval process, i.e. the number and complexity of various requirements and the expense involved in meeting those requirements.

**f. Assessment of Controls** – As noted above, Huntsville effectively implements the construction permitting and construction project management programs, thus ensuring that land use conforms to zoning requirements and that construction plans and specifications meet code requirements and City engineering standards.

**g. Discussion of Proposed Revisions** – There are no proposed changes to this element of the City of Huntsville SWMP.

## 12. CONSTRUCTION INSPECTIONS

**a. Objective** – To ensure that actual construction conforms to approved plans and specifications. For private development, this entails adherence to applicable codes and ordinances and to the approved plat. For public improvements, this entails adherence to contract specifications.

**b. Program Element Activities Completed** – The Inspection Department employs building inspectors, electrical inspectors, mechanical inspectors, and plumbing inspectors. The Engineering Department employs inspectors as well, whose responsibilities encompass inspection of construction of public improvements and infrastructure improvements in private developments that will ultimately be conveyed to the City for maintenance.

**c. General Discussion** – As noted above, the Engineering Department is responsible for inspecting infrastructure improvements which will become the property of the City. This applies to public improvements funded by the City as well as streets, drainage systems, and sewer systems in private developments if the improvements will be conveyed to the City upon completion of the work. (Note: private streets do not have to conform to City engineering standards, but the City will not assume maintenance responsibilities for such roadways). Engineering inspectors are assigned areas of the City as well as specific projects. The workload

is balanced by assigning a heavier load of individual projects to those inspectors with less private development occurring in their area. Typically, an engineering inspector will be on-site at a large City construction project on a daily basis to ensure that the work is performed satisfactorily. Engineering inspectors must also sign off on the construction of individual structures prior to issuance of a Certificate of Occupancy. However, for construction on single lots within a platted sub-division, there is typically only one inspection by an engineering inspector.

In contrast, construction of structures generally require a series of inspections by the Inspection Department, at various stages in construction. Thus, the foundation is inspected prior to erection of walls and the roof, rough-in and final electrical inspections are performed, rough-in and final plumbing inspections are performed, etc. This approach is taken to ensure that deficiencies are not “covered over,” and prevents work from progressing beyond certain points prior to verification that work is being properly performed.

**d. Compliance Status** – The City is in compliance with this element of the SWMP.

**e. Strengths and Weaknesses** – The performance of inspections is essential to ensure that actual construction adheres to applicable codes and to City requirements. Enforcement of these requirements by personnel in the field is viewed as a strength of this SWMP element. Huntsville’s inspectors are well-qualified and knowledgeable within their specific areas of expertise. This is also viewed as a program strength.

**f. Assessment of Controls** – Huntsville’s inspection procedures are effective in meeting their objectives.

**g. Discussion of Proposed Revisions** – No changes are being proposed or contemplated at the present time.

### **13. EDUCATION ACTIVITIES**

**a. Objective** – The objective of public education is to promote a general awareness of water quality concerns and issues, and to encourage proper handling and disposal of wastes. In addition, public education encompasses efforts to target particular audiences for presentation of technical information and Best Management Practices. Included in the latter category are outreach activities directed toward industrial facilities and toward the development and construction communities.

**b. Program Element Activities Completed** – Each of the components of Huntsville’s Public Education element of the SWMP is in place, as described below.

**c. General Discussion** – Several agencies are responsible for components of Huntsville’s overall public education effort. Natural Resources and Water Pollution Control work closely with the industrial community and continue to provide guidance to industrial representatives

regarding spill prevention BMPs. The City Planning, Engineering and Public Works Drainage Divisions have each contributed to efforts to educate developers and contractors on erosion control BMPs. Included in this effort are public availability of the SWMM, which presents a substantial amount of technical information on erosion control, and individual consultation with developers, architects and engineers during the subdivision approval process (reference the development Planning Procedures section of this narrative). In 1996 and 1997, the Drainage Division conducted workshops on the use of hydro-seeding techniques to control erosion. The Planning Division and Engineering Division co-sponsored a comprehensive erosion control workshop with ADEM, and ASCE in FY 2000. The City of Huntsville co-sponsored a series of workshops in FY 2003-04 entitled "BMP and Phase II Regulations." Other sponsors included the Flint River Conservation Association, the Madison County Soil and Water Conservation District and the Huntsville/Madison County Builders Association. As the name implies, these workshops focused on construction BMPs and the impact of the Phase II Regulations for NPDES permitting of construction projects with land disturbance in excess of one acre.

With implementation of the Phase II regulations, ADEM has established a comprehensive registration system for NPDES construction storm water permitting. Among the requirements imposed by these regulations are use of BMPs included in the *Alabama Handbook for Erosion Control, Sediment Control and Storm Water Management on Construction Sites and Urban Areas* (Alabama Soil and Water Conservation Committee). In addition, owners/operators of construction sites perform regular inspections. Inspections must be performed by a "Qualified Credentialed Inspector" trained through a "Qualified Inspection Program." ADEM currently recognizes training programs developed by the Homebuilders Association of Alabama and by Thompson Engineering, Inc. With these training requirements and programs in place, the City of Huntsville no longer views City sponsorship of erosion control workshops as being necessary. In fact, changes ADEM has proposed to the MS4 NPDES Permit for Huntsville would eliminate the requirements associated with construction activities in light of ADEM's Phase II program, including those related to integration of erosion control BMP training into the Public Education element of the SWMP.

Operation Green Team staff work out of the Mayor's office. Operation Green Team incorporates the activities formerly conducted by the Clean Community Division, but has an expanded role in environmental education and beautification. Litter prevention programs, which were the principal focus of Clean Community, remain a strong priority with Operation Green Team. Included in the category of litter control are public education on litter prevention, aimed largely at school-aged children; organization and coordination of community volunteers to conduct community clean-ups and the annual "Bag-A-Thon;" and promoting the adoption of specific areas for ongoing litter removal by area businesses and civic groups. The Adopt-A-Stream and Adopt-A-Mile programs are examples of this latter activity. As mentioned, Operation Green Team has broadened their mission to encompass other aspects of environmental education. Distribution of informational literature on water quality and on proper waste disposal has been incorporated into their presentations at area schools. Presentations to civic groups and garden clubs complement the efforts in the public school system. Statistics on these activities are included in the Summary Table of each Annual Report.

The Solid Waste Disposal Authority has implemented an ongoing program to educate the public about the importance of proper waste disposal, the value of recycling, and the SWDA used oil collection and HHW collection programs. Newspaper advertising, educational tours of the Refuse-to-Energy facility, and distribution of informational brochures are all used as components of the SWDA public education program. Statistics on these activities are included in each Annual Report.

Natural Resources has posted a copy of the storm water quality ordinance and an informational brochure on Division activities on the City web-site. In addition, copies of several informational brochures on protecting storm water quality were obtained from TVA and made available for the general public at the Natural Resources office. Natural Resources also developed an informational fact sheet on storm water pollution prevention, customized for the Huntsville area, and this brochure is available on the Natural Resources website at <http://www.ci.huntsville.al.us/NatRes/SWbrochure.htm>.

The efforts of the City of Huntsville and the SWDA are complemented by “EarthScope,” an organization within the Huntsville City Schools dedicated to environmental education. EarthScope personnel help coordinate presentations by agencies such as Operation Green Team, provide reference material to teachers within the school system, and conduct field trips. Examples of field trips held each year for fifth graders are a trip to a wetland area on Redstone Arsenal and a trip to Aldridge Creek to perform water testing and observe an urban lotic environment.

Legacy, an environmental education group funded at the State level also supports the City schools. Legacy conducted their first environmental education workshop for public school teachers during the summer of 1999. Additional workshops for Huntsville area teachers have been held since that time. A wide range of environmental topics are covered in these workshops.

**d. Compliance Status** – Huntsville is in compliance with the requirements of the SWMP.

**e. Strengths and Weaknesses** – The EarthScope programs and the presentations by Operation Green Team are non-technical and are generally geared toward children. However, Operation Green Team also makes presentations to the lay public as well. The SWDA public education efforts on proper waste disposal similarly are directed to non-technical audiences for the most part. Collectively, these efforts serve to improve public awareness of the importance of responsible environmental behavior by each individual. Much of the success of the programs is attributable to the fact that presentations are appropriately geared to the target audience. Furthermore, information is presented by people whose principal responsibilities involve public education and/or public relations. For this reason, these groups are far more effective in successfully conveying their message than engineers and scientists would be.

The technical personnel of the City focus more attention on educating the regulated public, rather than the general public. Thus, Natural Resources and Water Pollution Control personnel provide industrial representatives with information on spill prevention BMPs. Engineering and Planning

Department staff provide developers and contractors with information and guidance on SWMM requirements, including erosion control and retention requirements.

The approach taken by the City of Huntsville is seen as a strength of this program element. Having technical people provide information and outreach on the technical aspects of water quality protection, and non-technical people provide educational materials and make presentations to the general public and to school children helps ensure that the message is appropriate for the targeted audience.

At the time the last comprehensive narrative was prepared, a recognized weakness of the public education element was the relative inaccessibility of many of the educational materials. Natural Resources had obtained some very good informational brochures on storm water quality protection geared toward the general public. Copies were made available in the Natural Resources office and on the first floor of the municipal building. However, the number of “walk-in” people who had access to the information was consequently limited, and the number of people who realized the information was available was only a small subset of those entering the respective City offices. Although Natural Resources continues to make these brochures available in the lobby of the City’s Public Services building, an informational fact sheet customized for the Huntsville area has been developed and posted on the Natural Resources website, as discussed above. This has expanded access to storm water pollution prevention information by the general public, and addressed this previous weakness in the program, at least to some extent.

**f. Assessment of Controls** – Public awareness of all aspects of environmental protection has improved significantly over the past 10 years. Fewer people are aware of the importance of actions that the average citizen can take to limit non-point source pollution, however. Slowly, this situation is improving and the efforts by the City, ADEM, EPA and environmental education organizations such as Legacy are contributing to this increased awareness. Much remains to be done.

**g. Discussion of Proposed Revisions** – There are no proposed revisions to this element of Huntsville’s SWMP.

## **14. MONITORING AND SCREENING**

**a. Objective** – There are several components of this element of the SWMP, and each element has its own set of objectives. The wet-weather monitoring component involves periodic sampling and testing of representative outfalls and is used to provide data on overall storm water quality. This data is used to evaluate the quality of storm water associated with different land uses, as input in performing pollutant loading calculations, and ultimately will serve as a tool in assessing storm water quality trends. In addition to the wet weather monitoring, in-stream sampling, habitat assessment and bioassessment of area streams are employed to evaluate and identify overall trends in surface water quality. A third component of monitoring and screening that has been employed is dry weather screening of major outfalls, which serves to identify

possible illicit discharges. The presence of flow during dry weather suggests the possible existence of an illicit discharge to the storm sewer and triggers follow-up sampling and testing to help identify a possible source within the drainage area of the outfall.

**b. Program Element Activities Completed** – Huntsville has conducted annual wet weather sampling of the representative outfalls identified in the Permit, has performed all analytical testing specified in the Permit, and has reported the results of these testing activities with each MS4 NPDES Annual Report. The original MS4 discharge permit also required that Huntsville complete dry weather screening of all major outfalls in the storm sewer system once during each 5-year permit cycle. Huntsville completed one such cycle of dry weather screening during the period of permit application preparation, and completed a second cycle during the first term of the issued permit. No illicit discharges were identified as the result of this activity. Consequently, this was deemed to be an ineffective BMP and “formal screening,” with the attendant reports and data sheets for each outfall was discontinued at the time of Permit renewal, with ADEM’s concurrence. Dry weather screening is still done by the City’s drainage inspectors, who must inspect the entire drainage system annually and who have been advised to alert Natural Resources personnel to any suspect discharges to the City’s MS4. Natural Resources then conducts an investigation to identify the source of the dry weather flow or suspect discharge. In addition, a schedule of in-stream sampling and collection of samples for bioassessment has been established. There are 10 stations, and these are sampled on a three-year cycle. A total of 20 bioassessments have been performed to date and the second three-year cycle of sampling activities will be completed in FY 2005.

**c. General Discussion** – As specified in the MS4 Permit, Huntsville samples five representative outfalls on an annual basis. Each outfall was selected on the basis of the land use that comprises the drainage area of the discharge point. Thus, each sampling point drains an area comprised of a single land use. The five representative outfalls sampled by the City of Huntsville provide samples of institutional, industrial, low density residential, high density residential and commercial run-off. Wet-weather samples are collected by Water Pollution Control personnel and analysis of the samples is performed at the Water Pollution Control laboratory. Analytical results are then provided to Natural Resources for evaluation and inclusion in the MS4 NPDES Annual Report.

Natural Resources personnel perform the stream habitat assessments and collect the in-stream samples. Field measurements, such as D.O, temperature and pH, are performed at the time of sample collection by DNR. Laboratory testing is done in the Water Pollution Control laboratory, and bioassessment samples are sent to a contract laboratory for macroinvertebrate identification.

The more formalized dry weather screening methodology previously employed by Natural Resources entailed a visual inspection of each major outfall for evidence of illicit discharges. A field data sheet was completed for each outfall that served as a record of these observations. In the event dry weather flow was present, a sample was collected for analysis at the Water Pollution Control laboratory. In the event the presence of an illicit discharge was indicated, follow-up investigation would be performed by Natural Resources. However, as noted previously, this method of dry weather screening did not result in the detection of a single illicit

discharge after inspecting every major outfall twice. Consequently, ADEM concurred with modifying this ineffective BMP at the time of Permit renewal. Since permit renewal, less formal procedures are utilized for this type of dry weather screening. Currently, drainage inspectors routinely survey the entire drainage system for structural integrity, obstructions, etc. Standard Operating Procedures include notification of Natural Resources in the event any suspect discharge to the MS4 is observed. This approach eliminates duplication of effort and unnecessary paperwork.

**d. Compliance Status** – As noted above, Huntsville is conducting these activities in accordance with Permit requirements and is in full compliance with this element of the SWMP.

**e. Strengths and Weaknesses** – Sample collection and laboratory testing is performed by qualified personnel in accordance with EPA sampling protocol and EPA Reference test methods. The Water Pollution Control laboratory staff has considerable analytical experience and processes a large number of wastewater samples on a routine basis. The laboratory has a comprehensive Quality Assurance program. For all of these reasons, the quality of the analytical data generated by the WPC laboratory is viewed as being very good, and this is viewed as a strength of this program element. For the first several years of storm water monitoring, all analyses were performed in-house by WPC laboratory staff. However, increased centralization of POTW (Publicly Owned Treatment Works) process control testing resulted in a significant increase in workload for the central laboratory and storm water and industrial discharge samples began to be sent to a contract laboratory for several of the required analyses (e.g. PO<sub>4</sub>, Oil & Grease, Total Kjeldahl Nitrogen, heavy metals, etc.). This provides less internal control over laboratory Quality Assurance procedures. There have also been recent problems with the reported detection limits being too high to provide meaningful information on measured phosphate and oil and grease concentrations in the storm water samples. Water Pollution Control has identified a replacement laboratory, and this will hopefully resolve the problem regarding reported detection limits being dramatically higher than those achievable by the Reference Methods being employed.

Although problems that have arisen involving the technical details of monitoring can be satisfactorily resolved, there is a more fundamental difficulty inherent in storm water monitoring. Storm water quality is highly variable and establishment of trends is consequently very difficult. The problem of extrapolating results from representative outfalls to a drainage area as large as that served by the MS4 also has inherent weaknesses. This is due in part to the strong influence of individual storm events on the quality of the run-off as well as to the influence of the sampling point itself. To illustrate this point, consider the data collected by the City of Huntsville over the past ten years. (Reference the section of the Annual Report that presents the results of wet weather monitoring). A review of these data shows that pollutant concentrations vary widely within each land use, depending on the individual storm event. However, the average concentrations of most pollutants are similar among the various land uses. A notable exception to this general pattern is the concentration of TSS (Total Suspended Solids), which were substantially higher for the industrial sampling point than for the remaining land uses during the first several years of sampling. This pattern is an artifact of the fact that the industrial sampling point was in an earthen channel whereas the remaining sampling points were not. Furthermore,

scouring of this channel during heavy rainfall events worsened after installation of a weir to measure storm water flow in conjunction with sampling. Consequently, the samples taken from this sampling point were not representative of industrial runoff in Huntsville, and a more representative sampling location was ultimately identified by the City and approved by ADEM. The change in sampling location has resulted in an apparent significant reduction in TSS concentrations in Huntsville's industrial runoff, but in reality this is merely an artifact of the change in sampling locations.

Dry weather screening is potentially a useful tool in identifying and eliminating illicit discharges to the MS4. However, the formalized dry screening procedures initially used by the City of Huntsville were time consuming and singularly unproductive. Dry weather flow was observed in very few outfalls, and none of these flows were attributable to an illicit discharge. In each case of dry weather flow, the source of the discharge was identified as either a perennial spring that resulted in ground water entry into the storm sewer, or a leak in the water distribution system, resulting in the entry of potable water into the MS4. The water leaks identified by dry weather screening were repaired, which provided a benefit, but in no case was an illicit discharge identified and eliminated as a result of dry weather screening. For this reason, the City proposed use of less formal dry weather screening methods in conjunction with the routine inspection of the City's drainage system by the Engineering Division drainage inspectors. This request to modify an ineffective BMP was approved by ADEM at the time of Permit renewal and the revised procedures have been employed since that time. This has eliminated duplication of effort and reduced paperwork. Also, as part of ineffective BMP replacement proposal, the in-stream monitoring program was expanded and strengthened. This is providing information of much greater value than the formalized major outfall dry weather screening protocol.

**f. Assessment of Controls** – The wet weather monitoring activity provides useful information despite the limitations discussed in this narrative and in the sections of the Annual Report dealing with monitoring data and program evaluation. As time goes on, and the database continues to grow, the utility of this information will increase. The increased emphasis on in-stream monitoring to evaluate trends in surface water quality, which includes both physical-chemical testing and the use of biological indicators, has served to strengthen the monitoring program element.

**g. Discussion of Proposed Revisions** – Huntsville is not proposing any changes to this program element at the present time.

## **15. ADDITIONAL SWMP ELEMENTS**

### **GREENWAY MASTER PLAN IMPLEMENTATION -**

Although not formally a part of Huntsville's SWMP, development of greenways throughout the City holds great promise for providing water quality benefits in the future. Obvious benefits accrue from the incorporation of vegetated buffer strips along the banks of the creeks. However, greenway development provides more subtle water quality benefits as well. Greenways are

viewed as a substantial community asset and enhance the aesthetics of the urban environment. This changes the attitude of the general citizenry about urban streams in their neighborhood. Rather than being merely a “ditch” that serves no other purpose than to carry flood waters, the creek is viewed as a natural feature to be protected and enjoyed. This change in attitude results in improved community awareness with respect to water quality, and should result in reductions in littering and in the discharge of pollutants to the storm sewer by residents. Greenways provide an obvious focus for community “clean-up” events, as well.

The 1996 Annual Report included a brochure that described the City’s Greenways Master Plan. The narrative section of each subsequent Annual Report has provided updates on the status of Master Plan implementation.

**a. Objective** - The objective of the Greenway Master Plan is to develop a system of linear parks within the City of Huntsville. These parks provide passive recreation opportunities to residents and enhance the aesthetics of the communities in which the greenways are established and maintained.

**b. Program Element Activities Completed** - The system of greenways included in the Master Plan is shown on the maps on the following two pages. The first of these maps shows the status of Plan implementation as of March 2003. Since that time the portion of the Big Cove Creek Greenway shown in red, as a “greenway under construction,” has been completed. Thus greenways have been completed and opened to the public along Aldridge Creek, the Tennessee River, Indian Creek, Big Cove Creek and Wade Mountain. In FY ’04, the City of Huntsville acquired approximately 5.2 acres of land along Indian Creek, just north of Highway 72 West, for the Indian Creek Greenway Phase 3 project. When completed, Phase 3 will extend the Indian Creek Greenway north from Highway 72 to Providence School. In addition, the City acquired 4.7 acres in downtown Huntsville for development of a small urban park and the initial phase of the “Gateway Greenway” along an unnamed tributary of Pinhook Creek. Finally, the City acquired 120 acres of riparian wetlands along the Tennessee River just east of the Whitesburg Bridge (Highway 231) in FY 2004. When money for construction becomes available, this will allow extension of the Tennessee River Greenway eastward from its present terminus at the southern end of the Aldridge Creek Greenway. Although it will be many years before the vision of the Greenways Master Plan becomes a reality, steady incremental progress toward that goal has been made each year.

**c. General Discussion** - Selection of areas for greenway development is designed to take advantage of natural features of the Huntsville landscape. Walking trails and bike paths are integrated into the greenways, which border urban streams or wind through mixed mesophytic deciduous forest on the hills surrounding the City. Greenways have been completed along sections of Aldridge Creek, Indian Creek, Big Cove Creek and the Tennessee River, as well as atop Wade Mountain. Ultimately, if implemented in accordance with the Master Plan, an interconnected system of linear parks will be developed along the Tennessee River, Aldridge Creek, Huntsville Spring Branch, Pinhook Creek, Broglan Branch, Big Cove Creek, the Flint River, McDonald Creek, Dry Creek, Indian Creek, Betts Spring Branch, Barren Fork and Miller Branch. This system of creek-side greenways will be interconnected with walking trails on

Green Mountain, Monte Sano Mountain, Weatherly Mountain, Chapman Mountain, Smithers Mountain, Wade Mountain and Wallace Mountain. This is clearly a very ambitious Master Plan, which includes over 130 miles of trails and bike paths.

Although the City has been successful in obtaining grant money to implement components of the Greenway Plan, it is unrealistic to believe the City will be able to devote sufficient money to acquire all of the land, construct the amenities, and complete the landscaping needed for full development of the greenway system in the foreseeable future. However, the progress that has been made in developing the greenway system since Master Plan adoption in 1992 is rather remarkable and highly encouraging. Moreover, with a Master Plan in place, Huntsville's Planning Department is able to identify areas targeted for greenway development and work with developers to ensure that these areas are protected during development, and that easements are provided to the City wherever possible. To the extent that this can be achieved, this approach promises to lower overall development costs significantly, and protect the designated areas until funds gradually become available.

**d. Compliance Status** – Not Applicable.

**e. Strengths and Weaknesses** – The principal strengths of the greenway development program are alluded to in the introductory remarks preceding this section of the Narrative. The greenways benefit water quality by providing vegetative buffer strips along the banks of the urban stream. In addition, they increase community “ownership” of neighborhood streams, thereby increasing public awareness of water quality and fostering a sense of environmental stewardship by the residents of the area.

The principal weaknesses are the substantial capital costs and the resultant need to extend development over a very long period of time. In municipal budgets there are many competing public needs and allocation of large amounts of capital money toward greenway development is not feasible. Consequently, the Master Plan must be implemented in small increments and it is expected that it will take many years to completely develop the system of greenways envisioned in the Master Plan.

**f. Assessment of Controls** – Not Applicable.

**g. Proposed Changes** – None.