

INTEGRATED PEST MANAGEMENT PLAN

for

**WEST OLYMPIA DEVELOPMENT
THURSTON COUNTY, WASHINGTON**

March, 2024

Table of Contents

1.0	Introduction.....	1
2.0	Pests	1
3.0	Existing Site Location and Features.....	1
4.0	Management Area Objectives.....	2
5.0	Control Methods	2
6.0	Implementation Strategies	3
6.1	Prevention.....	3
6.2	Identification	3
6.3	Inspection	4
6.4	Thresholds for Control	4
6.5	Appropriate Control Actions	4
7.0	Recommended BMPS.....	4
8.0	Irrigation Practices.....	5
9.0	Fertilizing Options.....	5
9.1	Organic Mulches	6
9.2	Fertilizers	6
9.3	Application Guidelines.....	7
10.0	Weed Control	8
11.0	Fungicides.....	8
12.0	Insecticides	9
13.0	Chemical Application Practice.....	9
14.0	Products to Avoid	9
15.0	Storage and Handling of Chemicals.....	10
16.0	Hazardous Material Use, Storage and Disposal	10
17.0	Monitoring.....	11
18.0	IPMP Amendments	11

1.0 Introduction

This Integrated Pest Management Plan (IPMP) describes pest control methods and ongoing management guidelines to be employed by residents, owners and/or managers, employees and landscape professionals within the West Olympia Development in Thurston County, Washington. The residents, owners and management of the buildings within the West Olympia Development are responsible for the continued implementation and oversight of this plan because the facilities are located in a group A wellhead protection area.

The intent of the IPMP is to provide residents, owners and managers with guidelines to govern pest control methods within the development. The major goals of the IPMP are two-fold: to provide a structured process for pest management and to minimize the amount of chemical application within the West Olympia Development properties by emphasizing prevention and encouraging non-chemical methods of pest control in an effort to protect the Group A wellhead. This approach will aid in minimizing adverse environmental impacts, primarily groundwater contamination of the water system.

Effective pest management attempts to keep properly identified pest populations below a certain population or damage level, starting with the safest control methods. Successful implementation of the IPMP will require ongoing communication and cooperation between residents, owners, managers, employees and trained professionals. All employees will be given a copy of the IPMP for the West Olympia Development, and management will also provide educational materials to inform employees on various aspects of pest management. The appropriate professional consultant(s) shall be retained when necessary to provide assistance in implementing the plan.

2.0 Pests

Within this IPMP, a pest is defined as an unwanted plant, animal, disease, or organism intrusion into the development that is desired or required to be removed or controlled by the owners, management or Thurston County.

3.0 Existing Site Location and Features

The West Olympia Development consists of dividing an 11.28-acre parcel into thirty single family lots, one four-unit townhome, one three-unit townhome, and one two-unit townhome. The site is located in the Olympia UGA of Thurston County off of 24th Ave NW.

According to the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), the on-site soils are characterized to be Alderwood gravelly sandy loam, 0 to 20 percent slopes. These soils are part of hydrologic soil group C and have an infiltration rate of 0.6 to 2.6 inches/hour. A full geotechnical report has been provided in the Drainage Report as Appendix 6.

The proposed West Olympia Development will create both treatment and flow control facilities. In the northern middle portion of the proposed development, a Modular Wetland System will collect and treat most of the stormwater runoff generated from the pollution generating hard surfaces and will discharge into the wetland buffer using an

energy dissipator. On the southeastern side of the wetland, a second Modular Wetland System will collect and treat the rest of the PGHS runoff and will discharge into the buffer via a flow dispersal trench. The roof runoff from majority of the lots will be tightlined and discharged to a rock-lined protection outfall into the buffer. The roof runoff from the eastern lots will be tightlined to an infiltration trench on each lot where the stormwater will fully infiltrate.

4.0 Management Area Objectives

From the standpoint of an IPMP, there will be one management area for the parcel. Landscape professionals will likely be hired and along with the residents will maintain all areas within the West Olympia Development and provide pest inspections to ensure that these tasks are being performed regularly and thoroughly.

5.0 Control Methods

There are five main methods for controlling pest populations:

1. *Cultural Controls:* Methods that require an understanding of the culture of individual plant species or turfgrasses. Adequate site preparation, efficient use of water, need for aeration, and timing, selection, and efficient use of fertilizers are all examples of cultural control methods.
2. *Mechanical Controls:* Methods that require labor-intensive actions such as mowing, hoeing, and hand weeding.
3. *Physical Controls:* Methods that alter the site to prevent insect damage such as manual removal and destruction of pests, traps, and barriers.
4. *Biological Controls:* Methods include naturally occurring organisms such as predators and parasitoids, as well as naturally occurring and introduced microbial products.
5. *Chemical Controls:* Include insecticides, fungicides, herbicides, and other chemicals intended to control, prevent, or repel pests if used properly.

The overlying theme of the IPMP is emphasis on prevention as the best and most efficient means of pest control. Prevention of potential pest problems is best accomplished through use of cultural controls. Mechanical and physical controls also aid in prevention by removing potential pests before populations can increase and spread. Chemical and biological control methods should be used as the last line of defense, and should only be considered after other control methods have been exhausted. Oftentimes, chemical and biological controls do more harm than good by reducing both pest and beneficial organisms in the control process.

Combinations of these methods can also prove useful depending upon the specific situation. It is important to state that this Integrated Pest Management Program does not attempt to eradicate a pest, since in most instances it is desirable to allow the pest to survive in lower numbers in order to maintain the presence of natural predators.

6.0 Implementation Strategies

An IPMP is by nature dynamic and should change over time as specific control strategies within the community are implemented and evaluated. Ongoing development of an IPMP should involve periodic review of five principal components:

1. Prevention
2. Identification
3. Inspection
4. Thresholds for Control
5. Appropriate Control Actions

These steps are further described below.

6.1 Prevention

Prevention provides the best line of defense against potential pest problems and is the least costly. Many pest problems in landscapes can be avoided by selecting plants with known pest resistance and avoiding those plants that are known to be susceptible. To minimize the use of pesticides and fertilizers, at least 75% native species and/or drought tolerant plants shall be planted. Selecting indigenous plants provides the owner with an additional line of defense against pests, since most of these plants are resistant to local pest populations. The Thurston County Local Hazardous Waste Program has prepared a native and drought tolerant plant list that is available at the Thurston County courthouse and the WSU Cooperative Extension Office (360) 867-2189.

Other elements such as proper soil preparation, planting, irrigation, and mulching techniques discourage the presence of pest populations. Many symptoms resulting from inadequate prevention measures are incorrectly attributed to the presence of pests. This can result in needless chemical applications that fail to address the actual problem and contribute to groundwater contamination.

6.2 Identification

Proper identification of the pest or symptom affecting a given plant or plants is an essential step before determining the proper control action. Owners and managers should take responsibility to familiarize themselves with common indicators of pest problems and/or consult with a professional. There are several professional resources within the community to aid in the identification of pests. Landscape contractors such as ecoPro Certified Sustainable Landscape Professionals, nursery professionals, and the Master Gardeners at the WSU Cooperative Extension Office are all valuable resources that can identify pests and recommend appropriate control methods based upon their expertise. Although they should not be relied upon alone, reference books also provide another valuable resource in diagnosing or identifying a potential pest problem.

Before applying any control methods, the owner, manager or professional must determine whether action is needed or is likely to be effective. Affected plants should be evaluated in terms of their value in the landscape. It is possible that the value of the plant is much less important and could be replaced with less effort than chemical application. It may be too late for a control to be effective, or the problem may be minor. In some situations, no action may be the best alternative. If action is needed, control methods can be used individually or in combination. Priority should always be given to non-chemical control methods.

6.3 Inspection

Owners and managers should establish a schedule for systematically surveying their landscape for pests and damage evidence. This is an important activity and should be performed on a regular basis. By performing regular inspections, potential pest problems are controlled much easier than if the given pest has time to propagate and spread to other locations. It is recommended that a landscape professional be hired to regularly inspect landscape areas throughout the properties. Inspections should be more frequent in Spring and Summer months, which are the principal times for pest activity.

6.4 Thresholds for Control

Many pests do not actually kill plants, but simply make them unsightly. Landscaped areas will be maintained by a professional with the ability to provide an assessment of the existing state of the area and recommend management practices for the future. Such professional can recommend the point at which some level of control should be taken. Knowing when a plant is approaching such a threshold may influence its treatment as well, since the problems are best treated at a particular time of year, or by a particular combination of controls.

6.5 Appropriate Control Actions

Determining the success of a given treatment is essential in any modification of the IPMP. Comprehensive records shall be kept by the chosen professional. Complete records shall be kept for all treatment strategies in order to evaluate both short and long term success. Information to be recorded will include:

- Identification of the pest
- Location and size of affected areas
- Recent weather including rainfall and temperature
- Previous control methods
- Control method to be implemented
- Dates of implementation
- Observed changes in condition after treatment

Such detailed record-keeping will aid subsequent landscape professionals in fine-tuning treatment strategies.

7.0 Recommended BMPS

Adequate site preparation is essential for the successful implementation of the IPMP. Upper layers of topsoil should be removed from foundation and road areas and

stockpiled. This topsoil may then be reapplied to landscape areas as needed. In areas with little or no topsoil, soil amendments such as compost of well-aged manure should be added in a layer between 6 and 12 inches thick. This organic material should then be tilled into the soil thoroughly. The added organic material will serve to enrich the nutrient value of the soil, retain moisture, and filter impurities. After landscape is installed, the beds will be covered with 2-4" of compost. It is suggested that the beds receive additional compost or bark annually to retain soil moisture, provide nutrients, and help prevent weed growth.

In areas with existing noxious weed species such as Scotch broom and Himalayan blackberry, plants will be removed to an off-site dump. These plants will be mechanically pulled prior to excavation to remove as much of the below ground root system as possible. Contractors conducting site work should be mindful of cleaning their equipment prior to completing their work to avoid the spread of noxious weeds from site to site.

8.0 Irrigation Practices

Excess watering accelerates the movement of fertilizers and chemical residues through the soil before plants can fully benefit and can contribute to the presence of pests. Water requirements vary due to a variety of factors. After a watering schedule has been established, it is useful to remove a shovel full of soil between waterings and inspect the depth of watering being achieved. Soils that are excessively wet beyond plant root zones could benefit from less water and soils that remain excessively dry following watering may benefit from adding organic material that absorbs water. As a rule of thumb, watering schedules should be less frequent but with longer run times.

- Irrigation systems should be properly adjusted to water plants exclusively at a rate of 1" per week and adjusted to include rainfall.
- Watering should occur during early morning hours to reduce evaporative losses and minimize fungal problems in turfgrasses.
- During extreme drought conditions, watering will be restricted to priority plantings such as trees and shrubs.

Irrigation systems must be well adjusted in applying water only to plants, not to pavement. After plants are established, readjust the irrigation system watering frequency to account for deeper root systems.

9.0 Fertilizing Options

All plants need a supply of nutrients in addition to light, air and water for proper growth and development. Three main elements are responsible for proper plant development: nitrogen, phosphorus and potassium.

Nitrogen

Nitrogen is the element needed in the greatest quantity by plants. All nitrogen used by plants comes from combinations of organic matter, air, and commercial fertilizers and is responsible for most of the visible growth of plants. Nitrogen is found in forms that are either immediately available to plants (soluble or quick release forms) or not immediately available to plants (insoluble or slow release).

Due to the chemical nature of nitrogen, it is leached quickly and readily from the soil.

Phosphorus

Phosphorus is associated with root development in plants. The most effective method of applying a fertilizer containing phosphate is to concentrate it within the root zone. It is less mobile in most soils than nitrogen, but should be used sparingly to avoid overloading the soil or water with excess nutrients. In Washington State, phosphorus is not permitted in lawn fertilizer due to water pollution concerns (RCW 15.54.500).

Potassium

Potassium is an element also commonly referred to as potash. Potassium aids in the flowering and fruiting of appropriate plants and aids in a plant's ability to withstand stress. Potassium can also be leached from the soil like nitrogen and phosphorus.

Both organic mulches and commercial fertilizers contain these elements, as well as several trace elements required by plants in much smaller quantities. Excess irrigation and high rainfall can leach these nutrients from the soil.

9.1 Organic Mulches

Organic mulches such as barks and composts provide several advantages when compared to commercial fertilizers. The first advantage is that organic mulches provide a well-rounded nutrient source for most plant material and take the guesswork out of using the "right" combination of synthetic fertilizers. These mulches can be applied in the Fall and/or Spring and release nutrients slowly to plants as they break down. This provides most plants with a year-round nutrient source. As organic mulches decompose, they add structure to soils and provide greater moisture retention and help to regulate temperature extremes within the soil. The other benefit is that organic mulches slow the movement of water through the soil by their ability to absorb and retain water. For these reasons, organic mulches are the most preferable means of increasing nutrient levels within soil.

9.2 Fertilizers

Regardless of the specific types, fertilizers should only be applied when it becomes evident that a nutrient deficiency exists. Thurston Conservation District offers soil testing services and can recommend fertilizing rates and timing. Organic mulches will provide adequate quantities of nutrients to plants in the majority of situations and should be applied before fertilizers are considered. Fertilizer applications should not be used during the high rainfall winter season. Of the commonly applied fertilizers, application of excess soluble nitrogen constitutes the most serious risk to groundwater supplies.

Commercial fertilizers come in a variety of formulas and forms. These fertilizers usually come in dry or liquid forms that are applied directly to the surface of the soil. These fertilizers are available in quick and slow-release formulas. Slow-release fertilizers are less likely to cause water pollution problems, an important consideration due to the site location in a wellhead protection area. Quick release fertilizers contain forms of nitrogen

phosphorus and potassium that are readily available to plants. The advantage of this type of fertilizer is that a known nutrient deficiency can be corrected relatively quickly. However, quick release fertilizers should be used only in situations where a specific plant nutrient deficiency is evident. These types of fertilizers migrate quickly through the soil and provide little or no benefit to the plant if excess water is applied. Groundwater supplies may be contaminated by readily leached nutrients. It is recommended that quick release formulas be applied during periods of active plant growth and only when a nutrient deficiency can be determined.

In contrast, slow release fertilizers are applied as infrequently as once a year, ideally at the end of the rainy season. These fertilizers continuously break down, providing nutrients to plants year round. For this reason, it is much more difficult for slow release fertilizers to migrate through soil into the groundwater.

9.3 Application Guidelines

The following guidelines should be utilized when considering use of commercial fertilizers:

- Avoid needless applications of fertilizer. For lawns, mulching mowers return cut grass to the ground and can provide up to one-third of the entire nitrogen requirement of the lawn. When fertilizing is appropriate, avoid heavy applications of quick release fertilizers, especially in lawn areas. Rather, consider the use of a natural lawn fertilizer. Natural lawn fertilizers are slow-release, require fewer applications, and provide more uniform growth.
- In lawn areas, apply lighter rates of fertilizer more often. This practice is much more effective than applying heavy rates less often. As an example, one pound of soluble nitrogen per 1,000 square feet applied once a month poses less risk to groundwater than two pounds of soluble nitrogen per 1,000 square feet applied every two months.
- To fertilize a lawn properly, it is important to first determine the square footage of the lawn area to be fertilized. Once the square footage of lawn areas has been established, a good rule of thumb is to apply one- to four pounds of nitrogen per 1,000 square feet of lawn per year. It is recommended that lawn fertilizing be applied four times a year during the months of April, June, September and November. As a guideline, no more than one-half pound of soluble nitrogen per 1,000 square feet should be applied in any single application.
- It is possible to maintain a healthy lawn by using a natural lawn fertilizer once a year in September. If fertilizing twice a year, an additional application should be made in May.
- Avoid over-watering lawns immediately after applying fertilizer. A preferred alternative is to irrigate the lawn thoroughly a day or two before fertilizing

and water briefly after application – just enough to wash the fertilizer off the leaves and into the soil.

- Do not use “weed and feed” type fertilizers, which contain pre-emergent herbicides, on lawn areas.

10.0 Weed Control

Mechanical and cultural control methods are the preferred means of weed control within the West Olympia Development. These methods include combinations of hand pulling, tilling, installation of weed barriers, and application of organic mulch. These control methods are preferable to using herbicides, since herbicides may harm desirable plants and contaminate groundwater supplies. Chemical weed control is appropriate only in situations where mechanical and cultural means of control have been proven ineffective. If chemical weed control becomes appropriate, the following guidelines should be followed:

- Use www.GrowSmartGrowSafe.org to help select the least hazardous pesticide if needed. Do not use products rated high and moderate hazard for water pollution due to the location in a wellhead protection area. Products that are effective and environmentally friendly should be selected.
- Applications should be timed to provide for best results. Product label directions must be followed.
- Applications should be made during windless periods at least four hours before probable rainfall, and early in the morning before the day heats up.
- “Weed and feed” type fertilizers which contain pre-emergent herbicides shall not be used on lawn areas.
- Use of herbicides must be recommended and applied by a licensed professional.

11.0 Fungicides

Most fungi occupy areas with very specific environmental conditions. The progression of their life cycles is also very specific. For these reasons, fungicides should not be applied to vegetation until a professional has diagnosed the presence of a fungal infestation. The timing of watering can reduce many fungal infestations of plant foliage. Watering in the early morning will allow water standing on leaf surfaces to evaporate during the day and prevents the propagation of many leaf fungi. Careful attention to soil moisture levels can reduce the presence of fungi in the soil. Like other plant care chemicals, fungicides can also contribute to groundwater contamination. Once a professional has identified a fungus is present, a recommended treatment program, which may or may not involve fungicides, can be implemented and evaluated for effectiveness. Any use of chemicals shall be documented.

12.0 Insecticides

Insecticides should only be used when the level of infestation poses a threat to the life of the plant. Proper identification of the insect is the first step in controlling the problem. There are many beneficial insects which can help with pest control. See pictures of beneficial insects and strategies to help them to thrive in your landscape at www.GrowSmartGrowSafe.org. By identifying the insect, the professional can explore cultural means of controlling the insect by modifying the environment that may favor its presence. If insecticide application is recommended, it should begin with less toxic products. Use www.GrowSmartGrowSafe.org to help select the least hazardous pesticide if needed. Do not use products rated high and moderate hazard for water pollution due to the location in a wellhead protection area. Most insecticides are not specific. When applied, these insecticides don't distinguish between a pest and a beneficial insect, and, for this reason, often do more harm than good. Insecticidal soaps are effective against a variety of insects and should be used carefully and sparingly for the same reason. The advantage of insecticidal soaps is that they are safer for the environment when compared to their counterparts.

13.0 Chemical Application Practice

Any outbreaks of fungal disease or insect infestation should be recorded and subsequently monitored to see if the outbreak increases. A period of three weeks should be allowed after any pesticide application to monitor the effect of the application. Pesticide applications should not be made at a higher frequency than once every three weeks. Treated areas will be posted to notify residents of the application of pesticides. Any professional consultant or employee who applies pesticides shall be licensed by Washington State Department of Agriculture as a Public Pesticide Operator or Public Pest Control Consultant.

14.0 Products to Avoid

All recommendations in this IPMP regarding use of chemicals must also be followed by landscape professionals working within the West Olympia Development. Professionals will be required to adhere to this IPMP regardless of their possession of a state pesticide applicator's license with legal ability to handle restricted pesticides. Landscape contractors will avoid materials described herein when working within the West Olympia Development. A number of pesticides listed in the EPA National Pesticide Survey's *Leach List* (1998) are unrestricted chemicals. These have high potential for leaching into groundwater.

The use of the following common pesticides on the EPA list, and the use of any other "leacher" is not permitted in the community. Product labels should be consulted to determine whether these chemicals are present:

- Acephate
- Amitrol
- Altrazine
- Baygon
- Bentazon
- Carbaryl
- Chlorpyrifos

- 2,4-D
- DDDVP
- Diazinon
- 1,2-Dichloropropene
- Cis-1,3-Dichloropropene
- Trans-1,3-Dichloropropene
- Dieldrin
- Dicamba
- Picloram
- Pramitol
- Simazine
- 2,4,5-T
- Triclopyramine

15.0 Storage and Handling of Chemicals

Generally, all landscape maintenance chemicals are toxic and should be handled with care. All label requirements must be followed and only those chemicals recommended and approved for controlling the pest should be used. The following policies shall be followed in the community:

- Wear protective clothing when mixing and applying chemicals.
- Store chemicals in a dry place inaccessible to children, pets, or desirable organisms.
- Keep containers well marked and tightly closed.
- Save empty containers for disposal at a hazardous waste collection center.

16.0 Hazardous Material Use, Storage and Disposal

Cover, containment, and protection from vandalism shall be provided for all chemicals, liquid products, petroleum products, and non-inert wastes present on the site (see Chapter 173-304 WAC for the definition of inert waste).

Maintenance and repair of heavy equipment and vehicles involving oil changes, hydraulic system drain down, solvent and de-greasing cleaning operations, fuel tank drain down and removal, and other activities which may result in discharge or spillage of pollutants to the ground or into stormwater runoff must be conducted using spill prevention measures, such as drip pans. Contaminated surfaces shall be cleaned immediately following any discharge or spill incident. Spills should be reported to 911. Emergency repairs may be performed on-site using temporary plastic placed beneath and, if raining, over the vehicle.

Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations shall be followed for application rates and procedures.

Employees and residents are advised to avoid skin contact with hazardous materials such as oil, pesticides and household solvents and to wear gloves and use kitty litter or sawdust to absorb spills. All hazardous materials must be stored in water-tight

containers and taken to the Hazo House at the Thurston County Waste and Recovery Center at 2418 Hogum Bay Road NE in Lacey. Hazo House is open daily from 8:00 a.m. – 4:45 p.m. and is free for Thurston County residents, businesses must register and pay a fee.

17.0 Monitoring

As noted above, detailed record keeping is valuable in assessing the success of a particular IPMP treatment. Landscape professionals working at the West Olympia Development are required by law to keep careful records of chemical use.

Records of pesticide applications are required to be kept for a minimum of 20 years and will include:

- Date and time of pesticide application;
- Specific location of application;
- Purpose of application (target species);
- Material, lot number, EPA registration number, amount, rate, and concentration used;
- Method of application;
- Temperature, wind speed and direction, weather conditions;
- Applicator's name and operator's license number;
- Evaluation of results.

18.0 IPMP Amendments

Since a management plan can only be as effective as its constituent elements, it may be necessary to modify those elements as environmental factors or site specific conditions dictate. Such changes may be necessary to better direct pest management efforts as well as modify procedural directives identified in the IPMP. Any proposed changes to the IPMP will be submitted to Thurston County for review and approval prior to implementation.