UTILIZATION AND REQUIREMENTS OF UAVS FOR ENVIRONMENTAL PROJECTS

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Drones, or unmanned aerial vehicles (UAVs) are now being utilized more often for commercial applications that require aerial photography, collection of unique data sets or for surveying project sites. They have also become a useful and cost effective option for environmental applications when assessments are required for difficult to access locations.

Figure 1. Overhead view of spill pathway at remote pipeline release site.

ENVIRONMENTAL APPLICATIONS

Earthmaster employs drones on environmental projects to provide the consulting team and stakeholders with a comprehensive overview of project sites, surrounding terrain, and potential contaminant pathways and environmental receptors. They have been especially useful for the delineation and assessment of contaminated spill areas (Figure 1) and for vegetation evaluations on small and large phytoremediation and reclamation projects (Figure 2). Drones have also become a useful tool for monitoring and recording activities on construction projects allowing for clear visual communication of progress (Figures 3 and 4).

Figure 2. Overhead view of a revegetation program on a former oil wellsite.

Figure 3. Overhead view of treated soil removal at a remote impacted soil phytoremediation site.

LEGAL CONSIDERATIONS

Drones are designated as Remotely Piloted Aircraft Systems (RPAS) by Transport Canada and are regulated by the Canadian Aviation Regulations (CARs) when they have a takeoff weight of 250 g to 25 kg. Drones weighing more than 25 kg or are operated without a visual line of site

require additional certification. Companies and individuals operating drones must also ensure that the potential liability associated with drone use is covered by an insurance policy.

Drone Registration

Drones are considered by Transport Canada to be aircraft so they must be registered with Transport Canada and operators must obtain a drone pilot certificate in order to legally operate one. Registering a drone can be done through the drone management portal on the Transport Canada website.

Drone Pilot Certificate

Anyone operating a drone with a takeoff weight of 250 g or more must have a valid drone pilot certificate. For basic operations, this requires an online exam available through the Transport Canada portal. The cost of the exam is minimal; however, the passing score is 80% and the knowledge requirements are extensive, including theory of flight, meteorology, flight operations, airframes, etc. Transport Canada strongly recommends taking a review course prior to taking the exam. The pilot's certificate is valid for 2 years and Part IX of CARs must be followed at all times.

RESTRICTIONS

Drones cannot be flown over people, within 30 m of a building, and must not enter a controlled airspace. If the work site is in a park area, there are restrictions. Recreational use of drones is not allowed in provincial parks and commercial use within the park would require a relevant activity permit from the provincial authority. Recreational drone use is also prohibited in all Parks Canada places and for commercial drone use in these places, a Restricted Activity Permit is required. The fines can be significant for ignoring these restrictions and not having the applicable authorizations.

Figure 4. Overhead view of a watercourse crossing reconstruction.

CONCLUSIONS

Earthmaster has adopted drone use to assist with many daily field environmental activities. Drones provide a significant advantage for communicating project activities to team members, clients and regulators, monitoring project progress, remote scouting activities, and enabling easy and cost effective access and visual monitoring of remote sites.

REFERENCES

Government of Canada. 2020. Canadian Aviation Regulations SOR/96-433. Minister of Justice, Ottawa, Ontario. January 2020.

Government of Canada drone safety: https://www.tc.gc.ca/en/services/aviation/drone-safety.html