Annex B1-2
Report on the installation of the pilot plant

Subject	Project acronym / Ref. No.	Date
Deliverable under Action B.1	Etanolix 2.0 for LIFE+ / LIFE12 ENV/SE/000529	30/12/2014

Issued by	Company / Department
Linda Werner (PM/Technical Manager)	St1 Refinery AB / Technical Department

Report on the installation of the pilot plant

The overall installation was led by Greger Nilsson, St1's Construction Engineer, responsible for the construction and the installation of the pilot plant and tie-ins to the refinery.

Tie-ins to the refinery:

For the installation two subcontractors were used; *Konstruktionssvets* and *Empower*. For each of these companies two persons plus a manager were working with the installation during the whole installation period. At peak loads 4 persons plus a manager were working for each of the construction companies.

The installation also included civil work and for this the Civil Engineer in lead was Carl-Sixten Ullgren. Subcontractors doing the work on site were *Veidekke* and *Peab*. In average 4 persons were working full time during this phase. *Veidekke*'s staff on site was 3-4 contractors and *Peab's staff force* 3-6. The civil engineering part of the installation was linked to tasks and activities around e.g. excavation, piling, concrete, casting, and scarification and asphalting. This is jobs that the refinery are used to have done by contractors and well known how to organize. It all went well and the challenge was to organize the activities on site with different firms working next to each other with a tight timetable.

Picture 1. *The construction area spring 2014. From the left Carl-Sixten Ullgren and Greger Nilsson at the connection point for brackish water to new ethanol production plan from existing refinery system. In the back-ground; the distillation tower and the fermenters.*

Receiving station:

This part of the installation resulted in a lot of work to be fully executed by subcontractors (see also Annex A2-1). Below are shortly presented the companies that performed the jobs, what their area of expertise was and how many persons that were involved to do the work at the location concerning the receiving station.

- *Atritor limited*: Plastic separator installation checking, set up and test run supervision, 1 person 3 days
- *Forssan Levy*: Receiving silo modification works, 8 persons 5 days
- *Plåt & Spiralteknik*: Material conveyor system installation checking, 1 person 1 day

- *Raision Valmisasennus*: Receiving building installation works i.e. steel frame, walls, roof, steel structures and service platforms + service platforms on hydrolysis area, 3 persons 1 month

Picture 2. *Part of the receiving station building is seen in the picture. The door is open and the safety beam is down.*

Safety procedures – external assistance during installation of pilot plant:

Work permits are required for any jobs to be performed in the refinery area. This permit includes a risk assessment where the work tasks are described and how to protect the staff for not getting injured at the work place. E.g. for hot work a fire extinguisher and water hoses will always be close to the work place and gas detection will be carried out and continuously tested for in the work area before any defined hot job (were energy in one way or the other can be generated) can be started etc. To ensure the safety in the specific work location, for certain defined high risk jobs, safety guards from a subcontractor company named *Prevent bevakning* were hired. These

are always hired for refinery projects to be performed in according to procedures, and also in this project. In average 2 safety guards were contracted during the installation phase.