Ministry of Environment

E4498 V2

DRAFT REPORT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Appendices

PCB Management Project

March 2014

APPENDIX 1

Part of MoE Decision 8/1

مبدأ «الحد الادنى لارتفاع المداخن» الذي يطبق على المولدات

لتحقيق متطلبات التخفيف من الانبعاثات الناتجة عن المولدات التي تعمل على الزيت (الفيول اويل) ذات قدرة اكبر من ٠,٥ ميغاوات يخير صاحب الشأن بالتقيد بالقيم الحدية البيئية المذكورة بالملحق ٢ ـ ٩ او باعتماد مبدأ الحد الادنى لارتفاع المداخن لاطلاق غازات العدم.

اما معادلة تحديد ارتفاع المدخنة فهي على الشكل التالي:

$$H = h + (٠,٢ \times \sqrt{kVA})$$

H: ارتفاع المدخنة الكلي بالامتار

h: ارتفاع الابنية المجاورة بالامتار

kVA: القدرة الاجمالية للمولدات كالمنشآت القائمة -kW = kVA، اي القدرة الاجمالية المعرفة بكمية الفيول (الطاقة) القصوى المستعملة

امثلة عن احتساب الحد الادنى لارتفاع المدخنة

قدرة المولد الاجمالية (kVA = kW)	٥٠٠	١,٠٠٠	٢,٠٠٠	٢,٥٠٠	٣,٠٠٠	٣,٥٠٠	١٤,٠٠٠
ارتفاع المباني ضمن دائرة قطرها ٥٠م او معدل ارتفاع المباني في الجوار (م)	١٥	١٥	١٥	١٥	١٥	١٥	١٥
الحد الادنى لارتفاع المدخنة فوق سطح الارض (م)	١٩	٢١	٢٣	٢٥	٢٦	٢٧	٣٩

ان الحد الادنى لارتفاع المدخنة مرتبط بالشروط التالية:

نطاق التطبيق: اكبر من ٥٠٠ قدرة المولد الاجمالية (kVA = kW)

الحد الادنى للارتفاع: ١م + ارتفاع الابنية المجاورة (م) (داخل دائرة قطرها ٥٠م من المدخنة او معدل ارتفاع المباني في الجوار)

السرعة الدنيا لغازات العدم: ١٥م/ثا

اكثر من مولد واحد: القدرة الاجمالية

ملاحظة:

في حال كانت قدرة المولد الاجمالية اصغر من ٥٠٠ kW يكون ارتفاع المدخنة المطلوب يساوي مترا واحدا اضافة لارتفاع مكان المحرك.

ملحق ٣: القيم الحدية البيئية للنفايات السائلة المصرفة في البحر.

يبين العمود الاول مؤشرات التلوث المطلوب مراقبتها، اما العمود الثاني فيعطي القيم الحدية لصرف المنشآت القائمة والعمود الثالث لصرف المنشآت الجديدة. ان معايير الصرف المذكورة في العمود الثاني ستلغى عندما تصدق الجمهورية اللبنانية على تعديلات بروتوكول التلوث من مصادر برية ضمن اطار اتفاقية برشلونة. عندها تصبح القيم الحدية

المذكورة في العمود الثالث هي المعتمدة في جميع المنشآت.

ان تصميم منافذ الانابيب على الشواطئ، وتحديد طولها وعمقها يجب ان يتم وفقا لما يلي:

٣ ـ ١ معلومات عن قاع البحر

٣ ـ ١ ـ ١ مستويات القاع

٣ ـ ١ ـ ٢ تربة القاع

٣ ـ ١ ـ ٣ ثبات او حركة القاع

٣ ـ ٢ معلومات بيئية

٣ ـ ٢ ـ ١ تواتر سرعة الرياح واتجاهها

٣ ـ ٢ ـ ٢ الطوبوغرافيا المحلية والتأثير على التيارات، الرياح والامواج

٣ ـ ٢ ـ ٣ الملاحة، رفع الرمل من قاع البحر، الصيد، صيد الصدف، السباحة وغيرها من النشاطات

٣ ـ ٣ معلومات عن المواد المتدفقة

٣ ـ ٤ ميزات المياه المستقبلة

٣ ـ ٤ ـ ١ الوقت اللازم لموت البكتيريا ($T_{٩٠}$)

٣ ـ ٤ ـ ٢ عوامل الانتشار الافقي والجانبي

٣ ـ ٤ ـ ٣ عامل الانتشار العمودي

٣ ـ ٤ ـ ٤ الحرارة، الملوحة والكثافة

القيم الحدية البيئية للنفايات السائلة المصرفة في البحر

١	٢	٣
المؤشر	القيم الحدية البيئية للمنشآت القائمة	القيم الحدية للمنشآت الجديدة
الاس الهيدروجيني pH	٥ ـ ٩	٦ ـ ٩
الحرارة	٣٥ درجة مئوية	٣٥ درجة مئوية
الحاجة البيولوجية للاوكسجين بعد الحضن لمدة ٥ ايام (اوكسجين ملغ/ل)	١٠٠	٢٥
الحاجة الكيميائية للاوكسجين (اوكسجين ملغ/ل)	٢٥٠	١٢٥
اجمالي الحديد (Fe) (ملغ/ل)	٥	٥
اجمالي الزئبق (Hg) (ملغ/ل)	٠,٠٥	٠,٠٥
اجمالي النحاس (Cu) (ملغ/ل)	١,٥	١,٥
اجمالي النيكل (Ni) (ملغ/ل)	٢	٠,٥
الومينيوم (Al) (ملغ/ل)	١٠	١٠
امونيا (NH_4^+) (ملغ/ل)	١٠	١٠
انتيمون (اثميد) (Sb) (ملغ/ل)	٠,٣	٠,٣

القيم الحدية البيئية للنفايات السائلة المصرفة في البحر		
١	٢	٣
المؤشر	القيم الحدية البيئية للمنشآت القائمة	القيم الحدية للمنشآت الجديدة
اجمالي الرصاص (Pb) (ملغ/ل)	٠,٥	٠,٥
اجمالي الفوسفور (فوسفور ملغ/ل)	١٦	١٠
اجمالي القصدير (Sn) (ملغ/ل)	٢	٢
اجمالي الكربون العضوي (ملغ/ل)	٧٥	٧٥
اجمالي الكروم (Cr) (ملغ/ل)	٢	٢
اجمالي النيتروجين (ازوت)[٢] (نيتروجين ملغ/ل)	٤٠	٣٠
اجمالي زنك (Zn) (ملغ/ل)	١٠	٥
باريوم (Ba) (ملغ/ل)	١٠	٢
بكتيريا كوليفورم[٣] بالحضن على ٣٧ درجة مئوية في ١٠٠مل	٢٠٠٠	٢٠٠٠
دليل الفينول (ملغ/ل)	٠,٣	٠,٣
زرنيخ (As) (ملغ/ل)	٠,١	٠,١
زيت وشحم (ملغ/ل)	٣٠	٣٠
سالمونيلا	غياب كامل	غياب كامل
سولفات (SO_4^{--}) (ملغ/ل)	١٠٠٠	١٠٠٠
سولفيد (S^{--}) (ملغ/ل)	٥	١
سيانيد (CN^-) (ملغ/ل)	٠,١	٠,١
فضة (Ag) (ملغ/ل)	٠,١	٠,١
فليوريد (F^-) (ملغ/ل)	٢٥	٢٥
فوسفات (PO_4^{---}) (ملغ/ل)	٥	٥
كادميوم (Cd) (ملغ/ل)	٠,٢	٠,٢
كروم سداسي التكافؤ (Cr^{vi}) (ملغ/ل)	٠,٥	٠,٢
كلور نشط (Cl_2) (ملغ/ل)	١	١

القيم الحدية البيئية للنفايات السائلة المصرفة في البحر		
١	٢	٣
المؤشر	القيم الحدية البيئية للمنشآت القائمة	القيم الحدية للمنشآت الجديدة
كوبلت (Co) (ملغ/ل	٠,٥	٠,٥
مانغنيز (Mn) (ملغ/ل)	١	١
مركبات هيدروكربونية (ملغ/ل)	٢٠	٢٠
منظفات (ملغ/ل)	٣	٣
مواد صلبة عالقة (ملغ/ل)	٢٠٠	٦٠
نيترات (NO_3) (ملغ/ل)	٩٠	٩٠
AOX (المركبات الهالوجينية العضوية)	٥	٥

٢ مجموع نيتروجين كجلداهل (النيتروجين العضوي+ الامونياك) والنيتروجين النيتراتي (NO_3) والنيتريتي (NO_2).

٣ للنفايات المصرفة على مقربة من مياه الاستحمام وجب اعتماد قيم حدية بيئية اكثر صرامة.

ملحق ٤: القيم الحدية البيئية للنفايات السائلة المصرفة في المياه السطحية

يبين العمود الاول مؤشر التلوث، ويعطي العمود الثاني القيم الحدية للمنشآت القائمة، اما العمود الثالث فيعطي القيم للمنشآت الجديدة. القيم الحدية البيئية في العمود الثاني سوف تلغى عندما تصدق الجمهورية اللبنانية على تعديلات بروتوكول التلوث من مصادر برية ضمن اتفاقية برشلونة. عندها تعتمد القيم في العمود الثالث بصورة تلقائية ولجميع المنشآت.

تعرف المياه السطحية بانها المياه الموجودة على سطح اليابسة وهي تتدفق اما بشكل دائم او مؤقت عبر مجرى او مباشرة من الينابيع. يسمح بصرف النفايات السائلة في المياه السطحية شرط ان يكون الحد الادنى لتدفق المياه السطحية ٠,١ م^3/ثا.

القيم الحدية البيئية للنفايات السائلة المصرفة في المياه السطحية

١	٢	٣
المؤشر	القيم الحدية البيئية للمنشآت القائمة	القيم الحدية البيئية للمنشآت الجديدة
الاس الهيدروجيني pH	٥ ـ ٩	٦ ـ ٩
الحرارة	٣٠ درجة مئوية	٣٠ درجة مئوية
الحاجة البيولوجية للاوكسجين بعد الحضن لمدة ٥ ايام (اوكسجين ملغ/ل)	١٠٠	٢٥

القيم الحدية البيئية للنفايات السائلة المصرفة في المياه السطحية		
١	٢	٣
المؤشر	القيم الحدية البيئية للمنشآت القائمة	القيم الحدية البيئية للمنشآت الجديدة
الحاجة الكيميائية للاوكسجين (اوكسجين ملغ/ل)	٢٥٠	١٢٥
اجمالي الحديد (Fe) (ملغ/ل)	٥	٥
اجمالي الرصاص (Pb) (ملغ/ل)	٠,٥	٠,٥
اجمالي الزئبق (Hg) (ملغ/ل)	٠,٠٥	٠,٠٥
اجمالي الزنك (Zn) (ملغ/ل)	٥	٥
اجمالي القصدير (Sn) (ملغ/ل)	٢	٢
اجمالي الكروم (Cr) (ملغ/ل)	٢	٢
اجمالي النحاس (Cu) (ملغ/ل)	١,٥	٠,٥
اجمالي النيكل (Ni) (ملغ/ل)	٢	٠,٥
الومينيوم (Al) (ملغ/ل)	١٠	١٠
امونيا (NH_4^+) (ملغ/ل)	١٠	١٠
انتيمون (اثميد) (Sb) (ملغ/ل)	٠,٣	٠,٣
اجمالي الفوسفور(فوسفور ملغ/ل)	١٦	١٠
اجمالي الكربون العضوي (ملغ/ل)	٧٥	٧٥
اجمالي النيتروجين (ازوت)[٤] (ملغ/ل)	٤٠	٣٠
باريوم (Ba) (ملغ/ل)	٢	٢
بكتيريا كوليفورم[٥] بالحضن على ٣٧ درجة مئوية في ١٠٠مل	٢٠٠٠	٢٠٠٠
دليل الفينول (ملغ/ل)	٠,٣	٠,٣
زرنيخ (As) (ملغ/ل)	٠,١	٠,١

القيم الحدية البيئية للنفايات السائلة المصرفة في المياه السطحية		
١	٢	٣
المؤشر	القيم الحدية البيئية للمنشآت القائمة	القيم الحدية البيئية للمنشآت الجديدة
زيت وشحم (ملغ/ل)	٣٠	٣٠
سلمونيلا	غياب كامل	غياب كامل
سولفات (SO_4^{--}) (ملغ/ل)	١٠٠٠	١٠٠٠
سولفيد (S^{--}) (ملغ/ل)	١	١
سيانيد (CN^-) (ملغ/ل)	٠,١	٠,١
فضة (Ag) (ملغ/ل)	٠,١	٠,١
فليوريد (F^-) (ملغ/ل)	٢٥	٢٥
فوسفات (PO_4^{---}) (ملغ/ل)	٥	٥
كادميوم (Cd) (ملغ/ل)	٠,٢	٠,٢
كروم سداسي التكافؤ (Cr^{vi}) (ملغ/ل)	٠,٥	٠,٢
كلور نشط (Cl_2) (ملغ/ل)	١	١
كوبلت (Co) (ملغ/ل)	٠,٥	٠,٥
مركبات هيدروكربونية (ملغ/ل)	٢٠	٢٠
منظفات (ملغ/ل)	٣	٣
منغنيز (Mn) (ملغ/ل)	١	١
مواد صلبة عالقة (ملغ/ل)	٢٠٠	٦٠
نترات (NO_3) (ملغ/ل)	٩٠	٩٠
AOX (المركبات الهالوجينية العضوية)	٥	٥

٤ مجموع نيتروجين كجلداهل (نيتروجين عضوي+ امونياك) ونيتروجين نيتراتي (NO_3) ونيتريتي (NO_2).

٥ للنفايات المصرفة على مقربة من مياه الاستحمام وجب اعتماد قيم حدية بيئية اكثر صرامة.

ملحق ٥: القيم الحدية البيئية للمياه المبتذلة عند صرفها في شبكة الصرف الصحي

يبين العمود الاول مؤشر التلوث، ويعطي العمود الثاني القيم الحدية للمنشآت القائمة والجديدة.

يمكن لاصحاب العلاقة بصرف النفايات السائلة في شبكات الصرف الصحي ان يتفقوا على نطاق من قيم حدية بيئية لهذا الامر وذلك بالتعاون مع الفريق العامل في محطة المعالجة طالما ان القيم الحدية البيئية سوف تحترم وتطبق على المياه الخارجة من هذه المحطة.

القيم الحدية البيئية للمياه المبتذلة عند صرفها في شبكة الصرف الصحي	
١	٢
المؤشر	القيم الحدية البيئية للمنشآت القائمة والجديدة
الاس الهيدروجيني pH	٦ ـ ٩
الحرارة	٣٥ درجة مئوية
الحاجة البيولوجية للاوكسجين[٦] بعد الحضن لمدة ٥ ايام (اوكسجين ملغ/ل)	١٢٥
الحاجة الكيميائية للاوكسجين[٧] (اوكسجين ملغ/ل)	٥٠٠
اجمالي الحديد (Fe) (ملغ/ل)	٥
اجمالي الرصاص[٨] (Pb) (ملغ/ل)	١
اجمالي الزئبق (Hg) (ملغ/ل)	٠,٠٥
اجمالي الزنك[٩] (Zn) (ملغ/ل)	١٠
اجمالي القصدير (Sn) (ملغ/ل)	٢
اجمالي الكروم (Cr) (ملغ/ل)	٢
اجمالي النحاس[١٠] (Cu) (ملغ/ل)	١
اجمالي النيكل[١١] (Ni) (ملغ/ل)	٢
الومينيوم (Al) (ملغ/ل)	١٠
امونيا[١٢] (NH_4^+) (ملغ/ل)	ـ

٦ افتراض تركيز ٢٥ (ملغ/ل) عند المنفذ وقدرة تنظيفية ٨٠%

٧ افتراض تركيز ١٢٥ (ملغ/ل) عند المنفذ وقدرة تنظيفية ٧٥%

٨ القيمة الحدية البيئية ٠,٥ ملغ/ل عند منفذ محطة المعالجة.

٩ القيمة الحدية البيئية ٥ ملغ/ل عند منفذ محطة المعالجة

١٠ القيمة الحدية البيئية ٠,٥ ملغ/ل عند منفذ محطة المعالجة

١١ القيمة الحدية البيئية ٠,٥ ملغ/ل عند منفذ محطة المعالجة

١٢ افتراض الاتصال بمحطة معالجة بيولوجية. فعالية ٧٠ ـ ٨٠%، القيمة الحدية البيئية عند المنفذ ١٥ ملغ/ل نيتروجين

١	٢
المؤشر	القيم الحدية البيئية للمنشآت القائمة والجديدة
انتيمون (الاثميد) (Sb) (ملغ/ل)	٠,٣
اجمالي الكربون العضوي (ملغ/ل)	٧٥٠
اجمالي النيتروجين[١٣] (ملغ/ل)	٦٠
اجمالي فوسفور[١٤] (فوسفور ملغ/ل)	١٠
باريوم (Ba) (ملغ/ل)	٢
دليل الفينول (ملغ/ل)	٥
زرنيخ (As) (ملغ/ل)	٠,١
زيت وشحم (ملغ/ل)	٥٠
سلمونيلا	غياب كلي
سولفات (SO_4^{--}) (ملغ/ل)	١,٠٠٠
سولفيد (S^-) (ملغ/ل)	١
سيانيد (CN^-) (ملغ/ل)	١
فضة (Ag) (ملغ/ل)	٠,١
فليوريد (F^-) (ملغ/ل)	١٥
فوسفات[١٥] (PO_4^{---}) (ملغ/ل)	–
كادميوم (Cd) (ملغ/ل)	٠,٢
الكروم السداسي التكافؤ (Cr^{VI}) (ملغ/ل)	٠,٢
كوبلت (Co) (ملغ/ل)	١
مركبات هيدروكربونية (ملغ/ل)	٢٠
المنغنيز (Mn) (ملغ/ل)	١
مواد صلبة عالقة (ملغ/ل)	٦٠٠
نيترات[١٦] (NO_3) (ملغ/ل)	–
AOX (المركبات الهالوجينية العضوية)	٥

١٣ افتراض الاتصال بمحطة معالجة بيولوجية. فعالية ٧٠ ـ ٨٠%، القيمة الحدية البيئية عند المنفذ ١٥ ملغ/ل نيتروجين

١٤ افتراض تركيز ٢ (ملغ/ل) عند المنفذ وقدرة تنظيفية ٨٠%

١٥ على ان تحترم القيمة الحدية البيئية لاجمالي الفوسفور

١٦ على ان تحترم القيمة الحدية البيئية لاجمالي النيتروجين.

Part of MoE Decision 52/1

ملحق رقم ١٠
الحدود المسموحة لشدة الصوت
ومدة التعرض الآمن له

١ـ الحد المسموح به لمنسوب شدة الضوضاء داخل اماكن الانشطة الانتاجية:

تحديد نوع المكان والنشاط	الحد الأقصى المسموح به لشدة الضوضاء المكافئة ديسبل (أ)
١ـ اماكن العمل (فترة العمل اقل من ٨ ساعات) وبهدف الحد من مخاطر الضوضاء على حاسة السمع	٩٠
٢ـ أماكن العمل التي تستدعي سماع لشارات صوتية وحسن سماع الكلام	٨٠
٣ـ حجرات العمل لمتابعة وقياس وضبط التشغيل وبمتطلبات عالية	٦٥
٤ـ حجرات العمل لوحدات الحاسب الآلي او الآلات الكاتبة او ما شابه ذلك.	٧٠
٥ـ حجرات العمل للانشطة التي تتطلب تركيز ذهني روتيني	٦٠

أقصى مدة تعرض للضوضاء مسموح بها بأماكن العمل (مصانع وورش)
* القيمة المعطاة فيما بعد مبينة على اساس عدم التأثير على حاسة السمع.

ـ يجب الا تزيد شدة الضوضاء المكافئة عن ٩٠ ديسبل (أ) خلال فترة العمل اليومي ٨ ساعات.
ـ في حالة ارتفاع منسوب شدة الضوضاء المكافئة عن ٩٠ ديسبل (أ) يجب تقليل مدة التعرض طبقا للجدول الآتي:

منسوب شدة الضوضاء (ديسبل (أ))	٩٥	١٠٠	١٠٥	١١٠	١١٥
مدة التعرض (ساعة)	٤	٢	١	١/٢	١/٤

ـ يجب الا يتجاوز منسوب شدة الضوضاء اللحظى خلال فترة العمل ١٣٤ ديسبل.
ـ في حالة التعرض لمستويات مختلفة من شدة الضوضاء أكثر من ٩٠ ديسبل.
(١) لفترات متقطعة خلال دورة العمل اليومي، يجب الا يزيد الناتج.

(أ١ /ب١+ أ٢ /ب٢ + ... عن الواحد الصحيح

حيث :

أ: مدة التعرض لمستوى معين من الضوضاء (ساعة).

ب: مدة التعرض المسموح بها عند نفس مستوى الضوضاء (ساعة).

(في حالة التعرض للضوضاء المتقطعة الصادرة من المطارق الثقيلة).

تتوقف على مدة التعرض (عدد الطرقات خلال فترة العمل اليومية) حسب شدة الضوضاء طبقا للجدول التالي:

شدة الصوت (ديسبل)	عدة الطرقات المسموح بها خلال فترة العمل اليومي
١٣٥	٣٠٠
١٣٠	١٠٠٠
١٢٥	٣٠٠٠
١٢٠	١٠٠٠٠
١١٥	٣٠٠٠٠

تعتبر الضوضاء الصادرة من المطارق الثقيلة متقطعة اذا كانت الفترة بين كل طرقة والتي تليها ١ ثانية او أكثر. أما اذا كانت الفترة اقل من ذلك فتعتبر ضوضاء مستمرة ويطبق عليها ما جاء في البنود الاربعة السابقة.

٢ـ الحد الاقصى المسموح به لشدة الضوضاء في المناطق المختلفة

نوع المنطقة	الحد المسموح به لشدة الصوت ديسبل (أ)		
	نهارا من ـ الى	مساء من ـ الى	ليلا من ـ الى
المنطقة التجارية والادارية ووسط المدينة	٦٥ ـ ٥٥	٦٠ ـ ٥٠	٥٥ ـ ٥٤
المناطق السكنية وبها بعض الورش او الاعمال التجارية او على طريق عام	٦٠ ـ ٥٠	٥٥ ـ ٤٥	٥٠ ـ ٤٠
المناطق السكنية في المدينة	٥٥ ـ ٤٥	٥٠ ـ ٤٠	٤٥ ـ ٣٥
الضواحي السكنية مع وجود حركة ضعيفة	٥٠ ـ ٤٠	٤٥ ـ ٣٥	٤٠ ـ ٣٠
المناطق السكنية الريفية ومستشفيات وحدائق	٤٥ ـ ٣٥	٤٠ ـ ٣٠	٣٥ ـ ٢٥
المناطق الصناعية (صناعات ثقيلة)	٧٠ ـ ٦٠	٦٥ ـ ٥٥	٦٠ ـ ٥٠

نهارا من ٧ صباحا حتى ٦ مساء

مساء من ٦ مساء حتى ١٠ مساء

ليلا من ١٠ مساء حتى ٧ صباحا

APPENDIX 2

Odor Identification and Source Checklist

Odor Cause Diagnosis Questions	Odor Diagnosis Variables		Comments & More Help at
Odors in boats, cars, campers, trucks	Water leak at window, door, trunk Carpeting has been wet Seats have been wet Headliner has been wet		
Odors & Building Structure: does the odor relate to presence of a nearby air movement pathway	Building stairwell Heating and cooling duct system?		
Odors & Building height, use, occupancy: does the odor relate to the level in the building to:	Windows open when odor is present Windows shut when odor is present Stairwell present? Elevator present? Odors relate to elevator usage? Cooking odors		Odors may move among building levels via elevator shafts, stairwells, elevator movement
Odor Character: Describe the odor and its strength: *Also see Odors & Paints, below*.	chemical, flue gases, fuel gas, heating oil, sewer gas	rotten egg, mold, musty, plastic, food other_____	
Odors & Electrical Wiring: a smell of burning plastic may be associated with potentially dangerous overheating of electrical components, wire insulation, plastic receptacles or light switches. If you smell "burning plastic" or similar odors indoors or even outside of a building, a dangerous electrical failure could be present.	**Describe smell:** ---------- **Location of smell:** ---------- Aluminum electrical wiring? FPE Stab-Lok or Zinsco electrical panel? Electric heat? SAFETY -HAVE YOU TURNED OFF OFFENDING CIRCUIT? If not DO SO immediately.		Turn off any suspicious or malfunctioning electrical circuits immediately, install smoke detectors, call your fire department, and hire an electrician familiar with aluminum wiring.
Odors & Fans: while exhaust fans are often used to move odors out of a building, an investigation may be in order:	Does the exhaust fan or whole house fan or attic roof vent fan cause odors, dust, or even mold to move upwards through the building?		
Odors & Fireplaces: Type of fireplaces (gas, wood, coal)	Odor when fireplace in use? Damper open or shut? Type of fuel?		
Odors & Heating Equipment or other Appliances does the odor appear only when certain appliances are running	Stove/oven Heater Fans TV's others	Aquarium air conditioner clothes dryer clothes washers dishwashers	
Heating Oil fired equipment?	Î Related to oil fired equipment? Gas fired equipment? Present in or near ductwork?		

Odor Cause Diagnosis Questions	Odor Diagnosis Variables		Comments & More Help at
LP or Natural Gas	Î Gas odors present? Gas leaks at appliances, piping, regulators, or incoming gas line? Contacted gas company, fire department?		
Odor history When was the odor first noticed? For how long has it been observed?	Date first observed: Who first observed it? Was this related to any event? To any building modification? To any change in the building? Dates odor is present or absent?		Explain:
Events that may relate to Odor:	an event that involved an unusual number of occupants Change, service, or replacement of HVAC equipment Events, such as a fire or flood Modifications: additions, construction, window replacements, installation of insulation or change in building ventilation system or plumbing system or fixtures Pets added to the building Purchases: of new furnishings, carpeting, draperies, blinds Weather, heavy snowstorms, other weather related events, possibly recurrent or cyclical		
Odors & indirect odor sources Ex: the ability of heating and cooling ducts to pick up odors from one location and transport them to another in the building, through the ductwork.	Is there any indirect source the odor could originate from?		
Odor location	does the odor appear throughout the building on certain floors, in certain rooms, at certain walls?		
What is different about the room where an odor appears:			
What side of the building is the room on?	North East	South West	
What conditions are different there	sun exposure wind exposure nearby trees prevalent wind direction outdoor possible odor sources?		

Odor Cause Diagnosis Questions	Odor Diagnosis Variables	Comments & More Help at
What materials are unique to the odor-source room	carpets carpet padding drapes, window shades type and age of windows screens heat, air conditioning pet occupancy people occupancy laundry storage proximity to baths, kitchens, laundry openings between floors?	
What is different about the floor or level in a building where odors occur?	Proximity to basements, attics, leaks, rodents, pests, animals, heating equipment, pesticide treatments	
Does the odor appear related to specific equipment	heating or cooling system ductwork or air handlers Does it occur only when certain equipment is operating?	
Odors & Mold: moldy smells or odors present? Mold odors are generally MVOCs -these gases are produced inconsistently, not by all molds, and not under all conditions;	visible mold in the building? history of building leaks? Humidity levels exceeded?	Mold or "mildew" odor production may vary by indoor conditions such as temperature, humidity, light, darkness, even season or mechanical disturbance of moldy materials.
Odors & neighbors: does the odor correlate with activities by building occupants or building neighbors?	trash burning, level of septic system usage, use of woodstoves, coal stoves, home improvements, building projects, cooking, wine making.	
Odors & occupants: does the odor occur when the building is occupied by	large number of people visitors? specific individuals?	
Odors & paints: paints, both exterior and interior are odor sources some high VOC paints may continue to outgas VOCs at low levels for years after initial application	How long ago was paint last applied? Where? Type of Paint:	
Odor perceivers: who notices the smells?	Odor perceived only by certain occupants Odor noticeable to all occupants Odor noticed by occasional visitors Medical checkup – consulted with doctor	Some medical conditions can affect smell perception or can cause odor hallucinations

Odor Cause Diagnosis Questions	Odor Diagnosis Variables	Comments & More Help at
Odors & Pets or other Animals in Buildings: what is the history of animals and pets occupying the building?	Animal pests such as rodents: mice, squirrels, raccoons, insects, who may Animal urine or fecal waste on building surfaces, Dead animals in walls or ceilings.	
Odors & Plumbing:	Does the odor presence relate to the use or dis-use of plumbing fixtures in the building? Does heavy usage brings out the odor problem?	Problems with the building drain-waste-vent piping, leaks, and even loose toilets are common sources of sewer gases, septic odors, and even "rotten egg" odors in buildings.
Odor strength	is the odor perceived as strong or mild? Does the level of smell vary? Under what conditions?	
Odors & time of occurrence: does the odor appear all of the time or only at certain times.	All the time Only at certain times	
If Only at Certain Times: does the odor correlate to any of the following?	Time of day, sunlight, operation of heating or cooling equipment	
Time of year, season, foliage, outdoor or indoor activities	Note any correlations to these.	
Odors & local temperature Does the odor appear or disappear in relation to changes in building temperature?	If yes, explain:	
Sunlight striking plastic window screens may make a distinctive odor only on the sunlit side of the building **Plumbing system** drains or vent systems may release odors when a private septic system is under heavy use or in certain weather conditions	Do either of these conditions apply to the odor?	
Odors & weather conditions does the odor correlate with weather conditions:	Humidity temperature, rain, snow, wind? Does the odor or smell correlate with heavy snow-cover?	
Special thanks to reader Kathleen Black for initial preparation and suggestion of use of this odor checklist.		

APPENDIX 3

APPENDIX 4

Annex -I-

Terms of Reference (TOR)

Project Name: Institutional Strengthening of the Ministry of Environment

Reference Number: 00040894

Subject: Consultant to conduct Environmental and Social Impact Assessment (PCB Management Project)

1. Background

The Institutional Strengthening of the Ministry of Environment project was established early 2010 with the objective of setting up an enabling environment for sustainable environmental development at the national policy level.

To date, the project has supported the Ministry in a number of technical, financial and administrative initiatives, including administrative advise to the Minister in all what relates to the daily courier, internal management, agendas of the Council of Ministers' meetings, legislation, media, public relations and external affairs, etc.

This consultancy is about the planned GEF/World Bank/MoE project on persistent organic pollutants in the energy sector, with the background below:

Persistent Organic Pollutants (POPs) are chemical substances that persist in the environment, bio-accumulate through the food web, and pose a risk of causing adverse effects to the human health and environment. They are considered highly toxic to humans, causing birth defects, potential damage to the immune and respiratory systems, and the reproductive system, with women and children being especially vulnerable. The twelve original POPs (known as the "dirty dozen") include nine pesticides (DDT being the best known), polychlorinated biphenyls (PCBs) , and by-products of combustion and other processes, such as dioxins and furans. The Stockholm Convention is the United Nations treaty negotiated to eliminate POPs. Under the Convention, countries commit to reduce and/or eliminate the production, use, and/or release of the 12 POPs. The Republic of Lebanon ratified the Stockholm Convention in 2002 (Law 432) and completed its National Implementation Plan (NIP) in accordance with the provisions of the Convention in 2006. In addition, Lebanon signed and ratified the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal in 1994 (Law 387).
According to the NIP, Lebanon's top priorities in POPs management are: i) awareness raising; ii) institutional and regulatory strengthening; iii) PCB management; and iv) management of emissions of dioxins and furans. The Government of Lebanon (GOL) has invited the World

Bank (Bank) to implement a GEF-financed project that would deal with the first three priorities (sources of dioxins and furans are not well understood and potentially very expensive to regulate). Accordingly, the Bank and Ministry of Environment (MOE) prepared a Project Identification Form (PIF), which was approved by the GEF Council in June 2010 and included in GEF's work program.

Using funds from the Canadian International Development Agency (CIDA) POPs Trust Fund, the Bank engaged consultants (COWI/ECODIT/Mueller Consortium), to undertake a project preparation study with the following main elements: updating and expansion of earlier work on inventories of PCBs and PCB-contaminated equipment and sites; technical studies on cost-effective management and disposal options; and, definition of capacity building needs. This study ("the project preparation study") was completed in June 2011.

PCBs in Lebanon are mainly encountered in the electric power sector. Prior to the mid-1990s, they were widely used in power transformers and capacitors at various levels – power stations, sub-stations and distribution transformers. Most of this equipment is owned by Electricité du Liban (EDL), the state-owned power utility, but some is owned by some smaller private distribution utilities and by major power consumers, such as industries or hospitals. The recently completed inventory covers all these sources but is less complete with respect to private industry.

EDL owns and operates:
• Seven thermal power plants. With the exception of the two plants in Zouk and Jieh, Lebanon's power plants are relatively new (post-1995);
• Fifty-six substations;
• Almost 19,000 distribution transformer stations;
• Three filtration units for improving the oil's dielectric properties. The filtering process may be causing some degree of cross-contamination between PCB and non-PCB transformers because the same filtration units are used for both PCB and non-PCB containing dielectric fluids; and
• A warehouse and repair shop in Bauchrieh.

In Lebanon, responsibility for environmental management and protection rests with the MOE, which was established in 1993. While basic legislation is in place to regulate hazardous chemicals and emissions of toxic substances into the environment, detailed rules and regulations for POPs in general and PCBs in particular have not yet been drawn up. Importation of PCBs has been banned since 1997 but there is no specific prohibition on the manufacture or use of PCBs in the country. Strengthening of the legal and regulatory framework with respect to PCBs (and other POPs) is therefore a priority.
MOE has legal responsibility for environmental impact assessment (EIA) under Law 690/2005, defining the responsibilities and structure of MOE and under the Environmental Protection Law 444/2002. The application decree was adopted in 2012 (decree #8633). Although there is no specific legal requirement for social impact assessment, these topics is addressed in the EIA decree.

Lebanon's EIA system has been analyzed with respect to its equivalence with Bank policies and

procedures, following the Bank's Operational Policy (OP) 4.00. This analysis showed that the Lebanese system, the EU Directive on EIA, and the Bank's policies have many common features and are comparable in many respects. There are, however, two significant gaps – the lack of standard TORs and guidelines for specific sectors; and, a lack of a requirement for public disclosure and consultation on the Initial Environmental Examination and on the EIA Summary, even though these are required by Articles 13 and 14 of the Environmental Protection Law.
Despite delays in the approval of the application decree, MOE does have some experience in overseeing EIA for a number of locally- and externally-funded projects. The Country Environmental Analysis (CEA) characterizes MOE's EIA work to date as quite thorough and the quality of EIA reports as adequate but states that MOE has a weak record on the oversight of environmental management plans.

Project Development Objective (PDO)
The proposed PDO would be: to strengthen Lebanon's technical and managerial capacity for minimizing human and environmental exposure to PCBs. This would be achieved through:
• Maintaining an inventory and database of all PCBs in Lebanon;
• Strengthening the legal and regulatory framework for PCB management;
• Managing and disposing of all stocks of PCBs which pose a high risk in an environmentally sound manner;
• Demonstrating techniques for managing and disposal of other stocks of PCBs in an environmentally sound manner;
• Remediating selected high-risk sites contaminated with PCBs;
• Working on all of the above with the guidance of MOE and EDL.

Project Description
The Proposed Project will comprise the following four components:

Component 1: Institutional and Regulatory Strengthening ($0.5 million, including GEF $0.0 million)

1.1 Legal and Regulatory Strengthening
Prepare a POPs Management Decree, with implementing guidelines for PCB management.

Gaps in existing legislation for management of POPs (including pesticides, PCBs and dioxins and furans) would be identified and a new POPs Management Decree drafted, along with implementing guidelines for PCBs. The Project Management Unit would assist in the process of enacting the decree in the Council of Ministers (COM), including the holding of stakeholder consultations.

1.2 Institutional Development
Strengthen the capacity of MOE for regulating POPs and for managing the safeguarding and disposal of PCBs.

About five ancillary staff would be assigned about half-time from line departments of MOE to

the PMU to become conversant with PCB management processes. Additional staff would be recruited to help the chronically understaffed MOE gear up for new responsibilities. A training program would be implemented (see below) to improve awareness of POPs issues, facilitate internal coordination, and strengthen law enforcement with respect to POPs and hazardous chemical in general, including issuance of licenses for hazardous wastes management.
A POPs inventory and database would be established, for cradle to grave monitoring of POPs chemicals and, ultimately, other hazardous materials. A monitoring and evaluation system for the project would be set up.

1.3 Training
Train MOE and EDL staff to build capacity for POPs management.

Given the limited experience in MOE and EDL for POPs management, considerable emphasis would be given to training of staff at all levels. The training program developed under the project preparation study would be fine-tuned and implemented. These are likely to include:
• Postgraduate education in hazardous chemicals management for two staff.
• A study tour to witness good practices in the (1) containment and removal of PCB equipment, (2) containment and disposal of PCB stockpiles, (3) containment and clean-up of PCB hotspots (4) legal framework and institutional setup for management of hazardous substances.
• Seminars for MOE and EDL management.
• On-the-job training of PMU, PCU and ancillary staff.
• Training workshops for technical staff of MOE and EDL, including managers and workers in EDL's workshops. Issues to be covered may include: development of the legal framework for POPs and other hazardous substances management; management of hazardous waste; management of contaminated sites; human health and environmental effects of POPs; emerging issues in POPs management. In Year 2 of the project, this training would be extended to other holders of PCB-contaminated equipment.
• Training for staff of the Customs Administration involved in checking imported goods.

1.4 Public Awareness
Expand public awareness of the hazards posed by POPs chemicals and the techniques used for their management.

The public is generally unaware of the risks posed by POPs chemicals, including EDL workers daily exposed to PCBs. MOE would undertake a program of public education, in collaboration with NGOs, using a variety of media: websites, newspapers, radio and TV. This would include: information on the SC and Lebanon's commitments, actual and planned activities under the project and the potential role of the public in reducing POPs exposure. An example of the latter would be a campaign to prevent the uncontrolled burning of waste (the most significant source of dioxins and furans).

Component 2: Management and Disposal of PCBs and PCB-Contaminated Equipment ($ 5.3 million, including GEF $0.0 million)

2.1 High-Content PCB Out-of-Service Equipment
Identify, safeguard and dispose of high-content PCB out-of-service equipment.

High-content PCB transformers have been identified at three sites and high-content PCB capacitors at nine sites. Under the project, this equipment would be transported to the Bauchrieh site for repacking in UN-approved containers, storage and export to a certified disposal facility. The expected volume is 49 tons of equipment, containing about 12 tons of PCB and is classified as High Risk.

2.2 High-Content PCB In-Service Equipment
Identify, safeguard and dispose of high-content PCB in-service equipment.

Identified high-content PCB in-service equipment comprises 17 transformers at the Jieh power station. Following the preparation and implementation of a management plan, these transformers would be packed in shipping containers and exported to a certified disposal facility. This equipment totals 147 tons, with about 35 tons PCBs and is classified as High Risk. If other high-content PCB equipment is identified in private sector facilities that were not surveyed in the project preparation study, they would be safeguarded in situ.
Jieh is an old facility at the end of its economic life but kept running because of the acute shortage of generating capacity in Lebanon. If, under EDL's modernization Program, it is decided to modernize the station, the project (with EDL funding) would provide for replacement of the above transformers (possibly in different sizes and configurations) with equipment not containing PCBs. If it is decided to close or radically restructure the Jieh station, these funds would be available for other sub-components.

2.3 Establishment of Decontamination Capacity
Establish capacity in Lebanon for the cost-effective decontamination of transformers and other PCB-contaminated equipment.

Because of inappropriate maintenance practices in the past, a significant proportion of EDL's 19,000 distribution transformers have become contaminated from PCBs originating in older PCB containing equipment no longer in service. The project preparation study indicates that the most cost-effective option for rendering such equipment safe is for local decontamination through chemical means. In Year 1 of the project, a detailed feasibility study would be undertaken to confirm this assumption, to determine the preferred method of decontamination and whether the decontamination unit should be purchased by EDL or operated by a contractor. The advantage of the first option would be that EDL would have continued capacity to continue the decontamination program after the closing of the project. The study would also determine whether it is cost-effective to add a second stage of treatment (with Fuller's Earth) to clean the decontaminated oil for reuse in transformers.
A safe interim storage and decontamination facility would be established at the Bauchrieh site. Workers would be trained in safe work methods and provided with personal and collective protective equipment.

2.4 PCB-Contaminated Transformers In-Service in EDL
Demonstrate environmentally sound methods of inventorying, safeguarding and disposing of PCB-contaminated equipment.

Based on sampling under the project preparation study, about 2,800 are expected to be contaminated above the SC limit of 50 parts per million (ppm). However, the total volume of PCBs in these units is estimated at only 0.4 to 0.7 tons. Risks are classified as High, for EDL workers, but Medium for the general public.

Under the project, inventory work would be continued for 15,600 of EDL's distribution transformers, which are generally pole-mounted. Over a given year period, these transformers would be sampled for PCB content and those above 50 ppm tagged. The work would be done by EDL staff, after intensive training. The results would be entered in the inventory and tracking database under Sub-component 1.2.

It is estimated that about 730 transformers (containing about 395 tons of contaminated oil) would be drained, decontaminated, filled with replacement oil and returned to service. About 280 transformer carcasses would likely no longer be fit for service and would be disposed of by export to a certified disposal facility.

2.5 PCB-Containing Transformers and Capacitors in Other Sectors
Establish a sound management system for high-content PCB and PCB-contaminated equipment outside EDL's system.

Under the project preparation study, visits were made to 33 large industrial and other consumers of electricity and 5 tons of PCB capacitors but no high-content PCB transformers identified. The study estimates that the remaining users may have 10 to 30 tons of PCB capacitors, 50 - 20 high-content PCB transformers and up to 200 contaminated transformers.
Under the project, inventory work would continue and all high-PCB or PCB-contaminated equipment identified and marked. The project would fund the removal, safeguarding and safe disposal of the 5 tons of already identified high-content PCB equipment, under Sub-component 3.2. Financial arrangements for the replacement of such equipment are yet to be worked out. Workers would be trained in the safe management of any other high-content PCB or PCB-contaminated equipment identified.

Component 3: Management and Remediation of PCB-Contaminated Sites ($1.2 million, including GEF $0.0 million)

3.1 Bauchrieh Site and Workshop
Remediate EDL's workshop at Bauchrieh.

EDL's main workshop at Bauchrieh (in a heavily populated part of Beirut) is heavily contaminated with PCBs, as a result of decades of transformer repairs without knowledge of or concern about their possible PCB content. All soils and paving materials at the 4,600 m2 site are

potentially contaminated at dangerous levels. Total PCB content may be 0.2 tons. Risks are classed as Medium.
Under the first phase of remediation, a detailed site characterization would be performed, through sampling. Depending on the outcome of this phase, a remediation program would be designed and carried out, involving removing contaminated soil and concrete and cleaning equipment.

3.2 Bauchrieh Well
Remediate the Bauchrieh well.

A well 2 m in diameter at the Bauchrieh site has been used for the disposal of wastes of all kinds and is heavily contaminated with PCBs. Quantities are estimated as 55 tons of contaminated oil and an unknown quantity of sludge. Total PCB content may be 0.5 tons. Risks of groundwater contamination are classed as High, although limited sampling of nearby wells has been negative to date.

Under the first phase of remediation, the well would be emptied and the need for further remediation measures investigated. Under the second phase all highly-contaminated soil/concrete would be removed. A program of monitoring for ground-water contamination around the well would be carried out.

3.3 Zouk Power Plant
Remove contaminated soil and concrete from the Zouk power station.

At the Zouk Power Station, some of the high-content, out-of-service transformers (to be disposed of under Sub-component 3.1) are leaking, presenting a Medium risk for groundwater contamination. The total PCB may be 0.03 – 0.16 tons. The project would ensure the removal of high-contaminated soil/concrete below the high-content PCB equipment, together with the equipment, as well as the mapping of any remaining PCB contamination and preparation of a site characterization and risk assessment.

3.4 Other Contaminated Sites
Develop guidelines for site remediation and apply these to other identified sites.

Some contamination has been identified below leaking capacitors in substations (to be disposed of under Sub-Component 3.1). Total PCB content is less than 0.1 tons and risks are classed as Low. Under the project, guidelines would be developed for site characterization, risk assessment and remediation. An inventory of site contamination would be made, followed by removal of contaminated soil and concrete, as needed.

Component 4: Project Management ($ 0.5 million, including GEF $0.0 million)

Support for the PMU and EDL in project implementation, management and monitoring and evaluation.

Costs for this component include staff salaries for staff of the PMU and PCU, office and IT equipment and basic transport. Costs for consultant services are shown against each of the above components, although most of the services will likely be under one contract.

Total Project Cost - $7.6 million

Project Implementation Responsibility

Major responsibility for project implementation will rest with a Project Management Unit to be formed within MOE, with a Project Coordination Unit in EDL. The participation and cooperation of EDL, which will be essential to the achievement of project objectives, will be secured through a Grant Approval Decree.

2. Scope of Work, Responsibilities and Description of the Proposed Analytical Work

The proposed project is classified as Category "A" under the World Bank's Operational Policy (OP) 4.01 dated January 1999 (http://go.worldbank.org/RUEQVWD550). The project therefore requires a full Environmental and Social Impact Assessment (ESIA) and an Environmental and Social Management Plan (ESMP), including full stakeholder disclosure and consultation and to be completed prior to departure of the Bank's appraisal mission. The ESIA and ESMP should also be suitable for meeting Lebanon's requirements under the EIA Application Decree. The MOE is therefore engaging independent consultant to assist it to prepare an ESIA, together with an ESMP, in accordance with Bank requirements.

The objective of the assignment is: to draft an ESIA and ESMP for the proposed GEF PCB Management Project that is in full conformity with OP 4.01. Particular attention will need to be given to timely disclosure of relevant documents to stakeholders (in a form that they can understand), to consultation with such stakeholders on the scope of the impact assessment and on the content of the draft final ESIA and ESMP, and to ensuring timely delivery of the outputs of the assessment.

TASKS TO BE EXECUTED

For their technical analysis of potential environmental risks and the formulation of appropriate mitigation and management actions, the consultant is expected to draw heavily on the Preparation Study of COWI/ECODIT/Muller Consortium dated August 2011 – especially its Chapter 8 (Safeguard Standards and Procedures) (Annex 1 to this Terms of Reference), including Tables 8.1 (Environmental Management Plan - Mitigation Measures and Monitoring) and 8.2 (Implementation Schedule of Environmental Management Plan). While the consultant will be expected to review and improve this material in the light of best international practice and practicality in the Lebanese context, the main tasks will be the following:

a) Adding the dimension of social risk assessment and management to the environmental core;
b) Undertaking a scoping process for the ESIA in full conformity with OP 4.01;
c) Revising the Chapter 8 material in the light of stakeholder consultations and preparing a draft ESIA and ESMP;
d) Obtaining stakeholder feedback on the draft ESIA and ESMP and transmitting revised versions to MOE.

Information on "baseline" environmental condition at the project sites is described in detail in the COWI report just referred to.

Task 1: Social Safeguards

Sub-Task 1.1: Application of Bank Social Safeguard Policies

(a) **Physical Cultural Resources (OP 4.11)**[1]. The Bank's policy on Physical Cultural Resources typically applies for all projects located in or near sites of known cultural importance (whether man made or natural; above, below ground or underwater). Given the richness of Lebanon's archeological heritage, the possibility of finding objects of archeological or historic value cannot be discounted for those project activities involving ground disturbance. The consultant should:

- Carry out rapid on site investigations and consultations with government entities responsible for physical and cultural resources to determine the likelihood of encountering physical cultural resources in the specific project areas.
- Determine client capacity for implementing procedures, including those for chance finds, for addressing physical cultural resources.
- Propose specific "chance find" measures for inclusion into project and legal documents. The implement ability of the proposed chance find measures should be discussed with the concerned government entities responsible for cultural heritage.

(b) **Involuntary Land Acquisition and Resettlement (OP 4.12).** This policy applies in the event of involuntary land acquisition (temporary and permanent), relocation of households and when household assets or access to income/employment is affected as a result of the project. Based on information currently available, it is not believed that these conditions will apply to any of the project sites, as it is understood that all project activities will take place on land owned and occupied by EDL. Nevertheless, in order to reconfirm this information, the consultant will review and summarize the following:

- Specific data on all the land needs (temporary and permanent) of the project, including

[1] Although this policy is now considered an "environmental" policy, it is grouped here for convenience.

ownership type (state or private).

- The status of the planned small temporary storage facility for decontamination of transformers. In particular, determine where this facility will be located.
- Other data on individual, household or businesses impacts to assist with the determination of OP 4.12 applicability.

Task 2: Social Risk Management

The Consultant shall carry out the following tasks to assess the social risks of this project. The Consultant will identify potential affected population and other stakeholders as needed to ensure all potential social risks are identified and managed.

Sub Task 2.1: Identification of Affected Population

The consultant will identify the populations affected by this project, including those that are likely to come into contact with PCB equipment and wastes in the future. These may include: workers who are working on PCB equipment, recyclers of PCB equipment, residents or property owners around PCB contaminated sites and others. The consultant should pay special attention to residents around disposal facilities (if such domestic disposal approaches are selected), who may be affected by operations of the facilities. To carry out the above, the consultant is expected to make site visits to ensure this list of affected population is exhaustive.

Sub Task 2.2: Identification of Social Risks

Based on results of Sub Task 2.1, the consultant shall investigate the project's social risks (e.g. health and economic impacts) on the affected populations. While the consultant is expected to identify the range of potential positive and negative risks (including measures for their mitigation and management), particular attention should be given to the following:

The consultant shall review operations of identified facilities to ensure potential social risks of the disposal operations are well addressed at these sites. To achieve this goal, consultation with stakeholders related to the disposal facilities should be carried out.

Sub Task 2.3: Report Preparation

The consultant shall include the information generated under Tasks 1 and 2 in the overall ESIA.

Task 3: Scoping Workshop for the ESIA

Sub-Task 3.1: Review of Project Background

The consultant shall review all project background materials, including but not limited to, the following:

- Preliminary PCB inventory conducted in 2004-2006;

- Project Identification Form (March 2010); and
- MOE/WB/COWI-Ecodit/Mueller Preparation study (August 2011) with emphasis on Chapter 8 (Safeguard Standards and Procedures)

On the basis of this review, the consultant shall prepare for the scoping workshop a document in easily understood language which summarizes:

- What are PCBs and why they are harmful?
- The main sources of PCBs in Lebanon and their relative risks
- How proposed project activities will manage such risks
- Other data on the project, such as duration, costs and institutional responsibilities
- A checklist of potential environmental risks and impacts

This document shall be prepared in English and Arabic, in hard copy and PowerPoint or similar format.

Sub-Task 3.2: Support to the Project Scoping Workshop

The consultant shall assist the MOE in conducting an initial screening workshop for all interested stakeholders to reach consensus on the main issues for the ESIA and ESMP.

The consultant shall identify potential stakeholders, such as officials of the MOE, Ministry Energy and Water, EDL and other central government agencies, local government officials in "hotspots", such as Bauchrieh, Jieh and Zouk, chambers of commerce and industry, environmental NGOs and the populations living near such hotspots.

The consultant shall prepare advertising materials for MOE to advise stakeholders of the date, time, place and purpose of the initial screening workshop. Such materials may include: MOE's and EDL's websites, newspaper advertisements in English, French and Arabic, posters to be placed at major project sites, like Bauchrieh, Jieh and Zouk and emails to government agencies and NGOs.

At the workshop, the consultant shall assist MOE, as needed, in making presentations. MOE and EDL staff, however, will be responsible for answering questions from stakeholders.

The consultant shall keep a record of the names and contact information of all participants and make a summary of the proceedings, including all major critical comments or questions. This summary shall form an Annex to the ESIA.

Task 4: Preparation of a Draft ESIA and ESMP

The consultant shall review the results of Tasks1, 2 and 3 to determine the main issues to be addressed by the ESIA and ESMP. He shall also review Chapter 8 of the project preparation study and determine if its scope remains appropriate to serve as the basis for those documents. If Task 3 has uncovered significant new issues or information, the consultant may request appropriate changes in these TORs.

The consultant shall draft an ESIA and ESMP in close conformity with OP 4.01, Annexes B and C, with the addition of a chapter on social risks and their mitigation and management. He should pay particular attention to:

- Policy, legal and institutional framework, including Lebanon's recently adopted EIA Application Decree.
- Analysis of alternatives, including the "do nothing" alternative. In proposing alternatives, the Consultant should give particular attention to alternatives sites, within EDL's system, for project activities, such as collection, storage, decontamination and shipping of oils, transformers and capacitors, so as to minimize their impact on the environment and human health and safety.
- In the ESMP, clear definitions of institutional responsibilities for each mitigation action, timing and, where appropriate, cost, as well as a monitoring framework.

The consultant should allow appropriate time between submitting the draft ESIA and ESMP to MOE and proceeding to Task 5.

Task 5: Consultation on the Draft ESIA and ESMP

After MOE has reviewed the draft ESIA and ESMP, the text shall be posted for public review on MOE's and EDL's websites, at MOE's library, at public libraries near the project sites and elsewhere, as needed. The documents shall be in English, with an Arabic translation of at least the Executive Summary.

The consultant shall assist MOE in conducting a stakeholder workshop to discuss the documents. The consultant shall review the lists of invitees and attendees of the initial scoping workshop and add the names of any newly identified persons with an interest in the project.

The consultant shall prepare advertising materials for MOE to advise stakeholders of the date, time, place and purpose of the final workshop. Such materials may include: MOE's and EDL's websites; newspaper advertisements in English, French and Arabic; posters to be placed at major project sites, like Bauchrieh, Jieh and Zouk; and emails to government agencies and NGOs.

At the workshop, the consultant shall assist MOE, as needed, in making presentations. MOE and EDL staff, however, will be responsible for answering questions from stakeholders.

The consultant shall keep a record of the names and contact information of all participants and make a summary of the proceedings, including all major critical comments or questions. This summary shall form an Annex to the ESIA.

The consultant shall revise the draft ESIA and ESMP to reflect the results of the workshop and transmit them to UNDP/MOE, for onward transmission to the Bank.

3. Qualifications Required

Title: Environmental and Social Impact Assessment Consultant

The Individual Consultant should possess the following minimum qualifications:

I- Academic Qualifications:

a. University Degree (Bachelor or equivalent) in engineering, environmental science or related fields;

II- Years of Experience:

a. Experience of not less than 7 years in the design, implementation or evaluation of environmental projects, including some experience in environmental impact assessment;

b. Experience in in hazardous waste management and specifically in PCBs is a plus.

III- Competencies:

a. Familiarity with the environmental legislation of Lebanon ;

b. Good communications skills, both oral and written, and ability to write well in English and Arabic;

c. Negotiations skills;

d. Familiarity with the Bank's Safeguard Policies an asset.

4. Duration of Contract

- 20 man-days over a period of maximum 8 weeks.

5. Schedule of Implementation and Deliverables

The overall time for completion of the assignment is 8 weeks from the date of contract signature. It is recommended that the consultant follows the timetable below but minor variations are permitted, as long as the overall time for completing the assignment is not exceeded.

Week from Signing	Activity	Deliverables
1	Mobilization	Inception report
2	Scoping workshop preparation	Summary document for workshop
3	Scoping workshop and preparing summary of proceedings	
4 and 5	Undertake social risk assessment Prepare draft ESIA and ESMP documents	Draft ESIA and ESMP
6 and 7	Wait for MOE review of ESIA and ESMP	
7	Prepare final workshop	
8	Final workshop and revision of ESIA and ESMP	Final draft ESIA and ESMP

DISCLOSURE OF INFORMATION: The consultant shall not disclose any information related to his mission to third parties, under the measures to breach the signed contract. All hard and soft copies of the used material in the mission are considered as MOE's property.

6. Payment Schedule

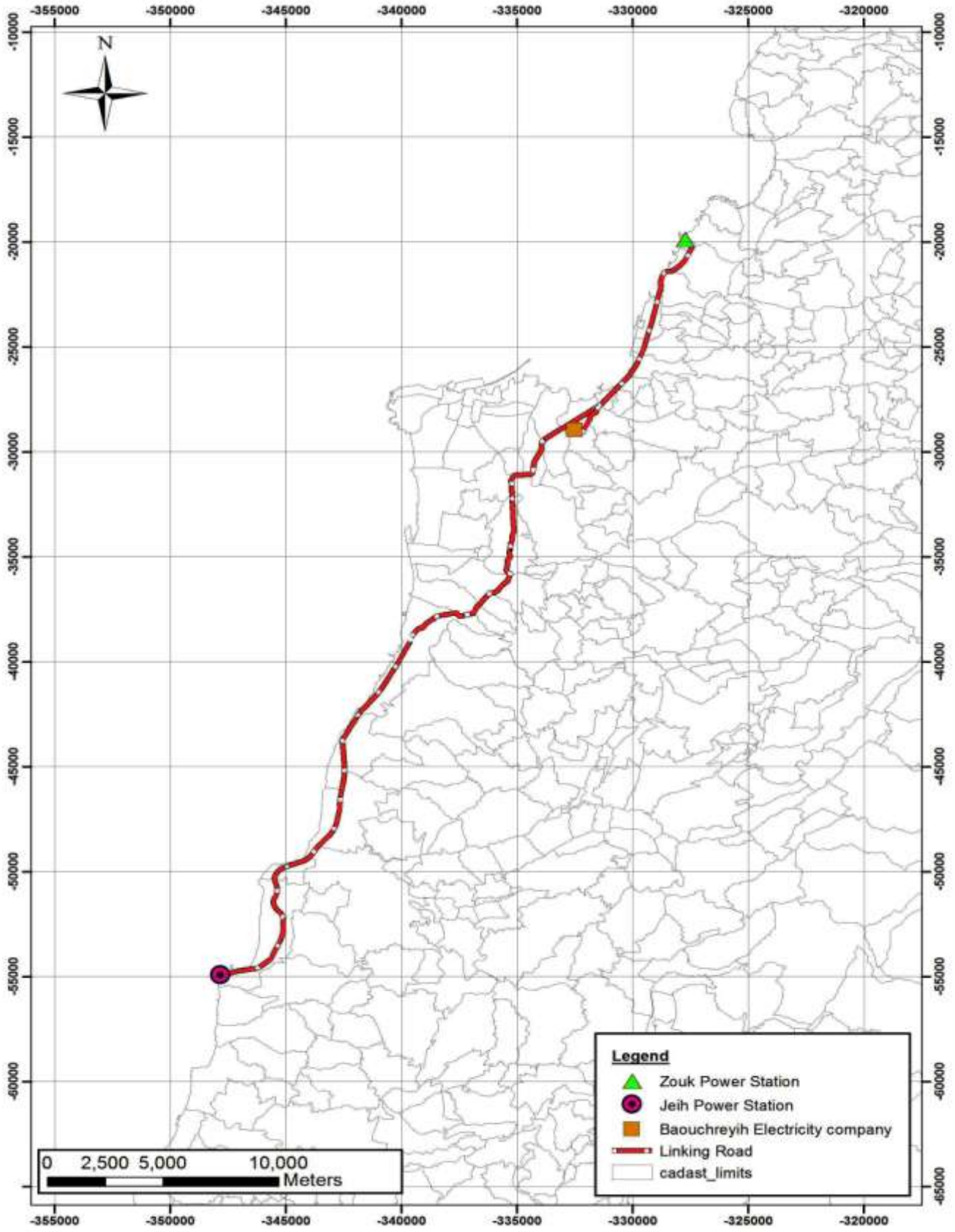
Payment will be made in four installments following the submission of COP and approval of ISMOE Project of each deliverable as shown in the table above.

Activity	Deliverables	Payment Schedule
Mobilization	Inception Report	10%
Tasks 1, 2 and 3	• Draft report on Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) • Proceedings of the screening workshop	65%
Task 4	• Proceedings of the consultation workshop • Final draft report on Environmental and Social Impact	25%

7. Facilities to be provided by the MoE

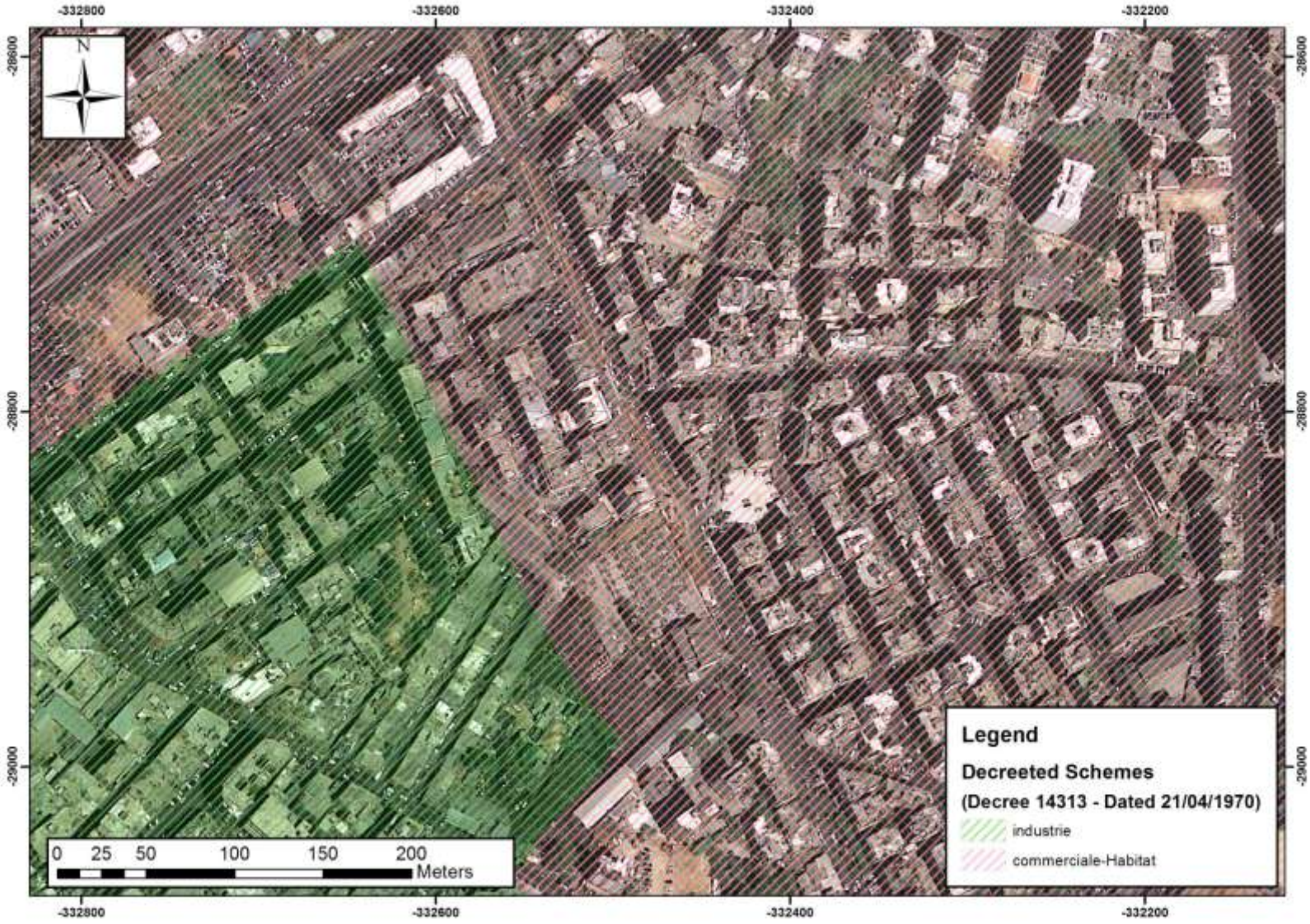
- The consultant will provide his own office space, IT facilities and transport.
- MOE will provide copies of all documents related to the project, including, but not limited to, the EIA Decree, NIP, and the project preparation study.
- MOE will provide space for the two workshops and will bear all costs related to the participants, including advertising, documents, and refreshments.

APPENDIX 5

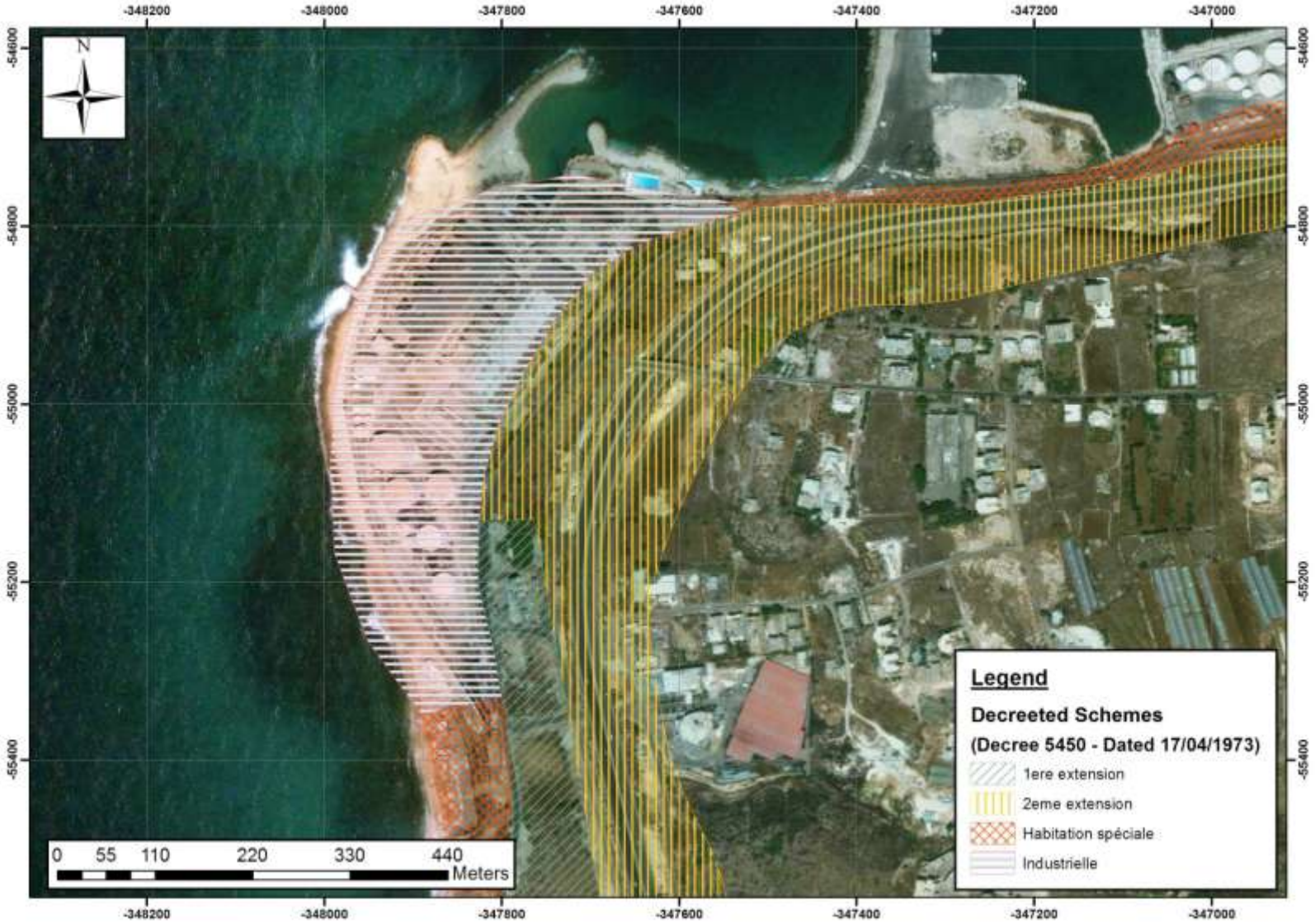


Map 1: General location of Sites.

Map 2: Decreeted schemes for of Zouk Site.

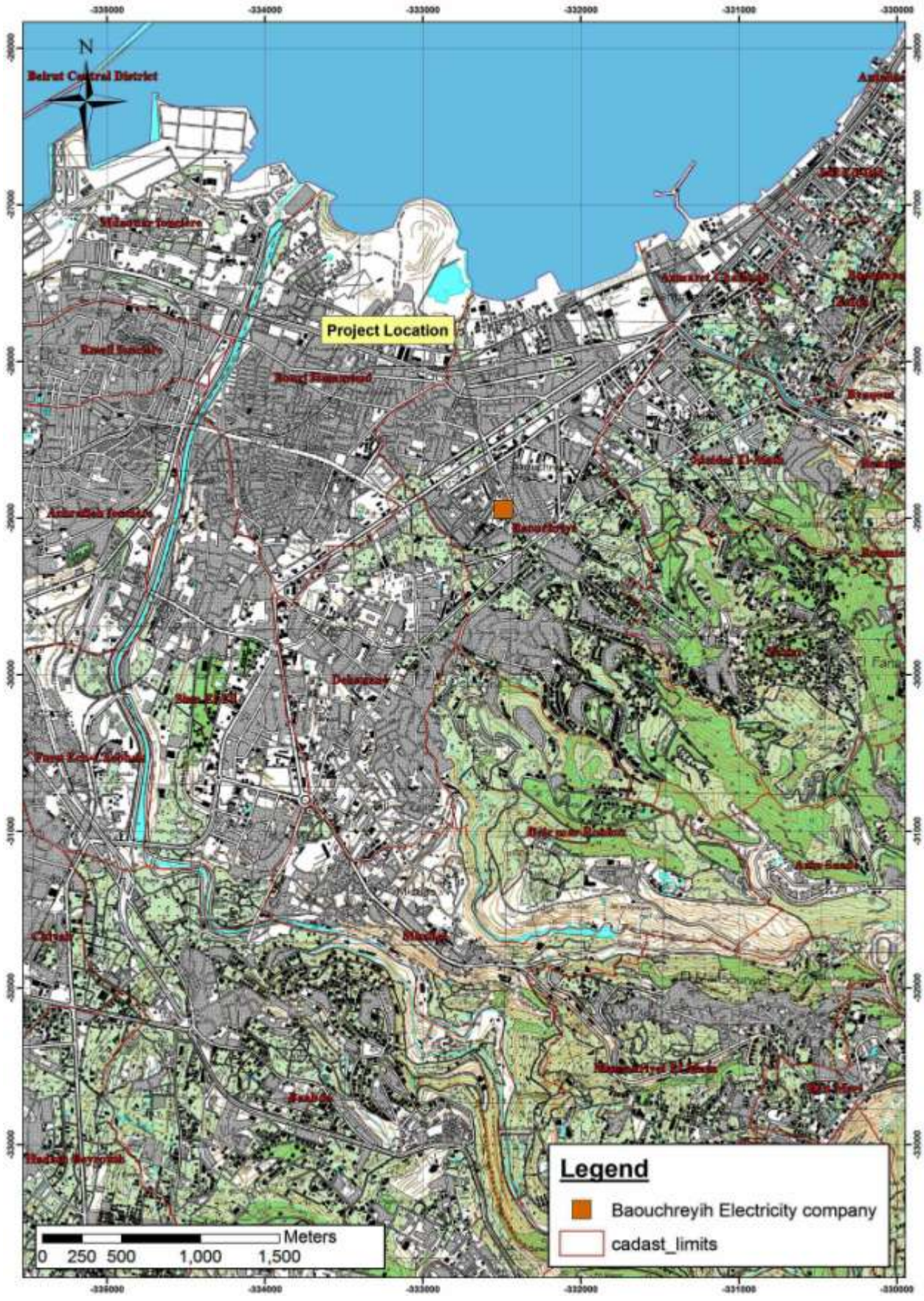


Map 3: Decreeted schemes for of Baouchriyeh Site.

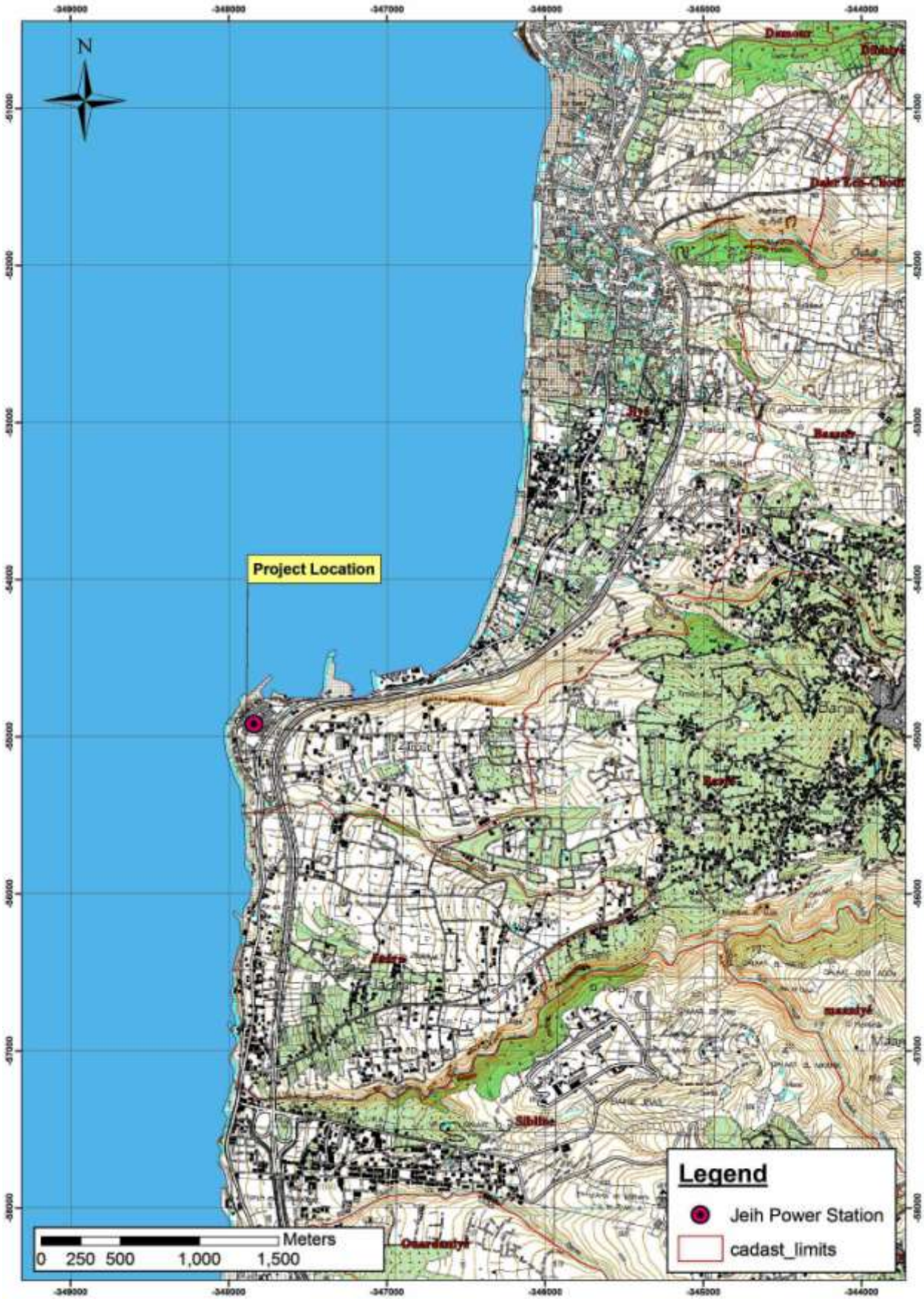


Map 4: Decreeted schemes for of Jiyeh Site.

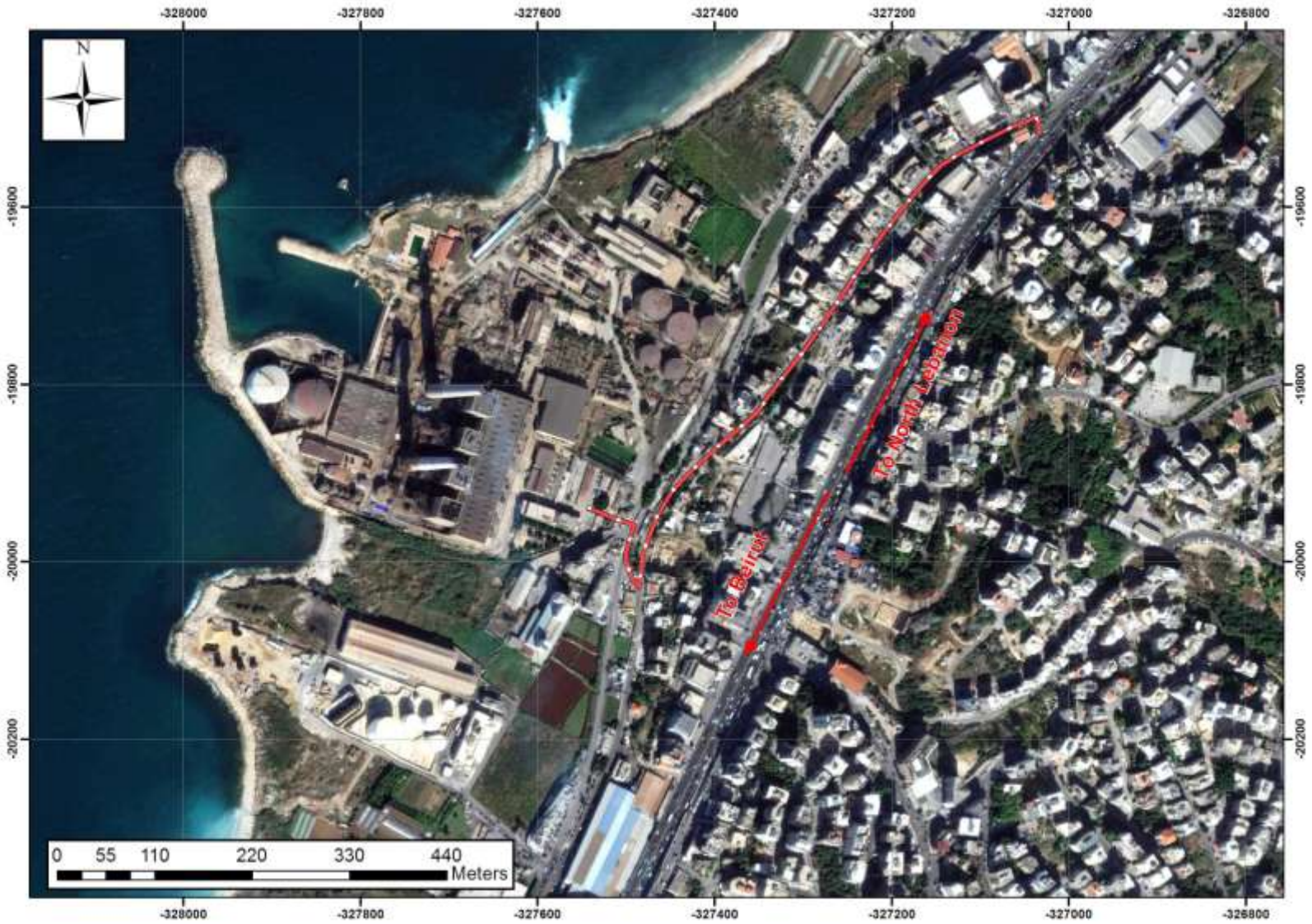
Map 5: General topographic map of the Zouk site area.



Map 6: General topographic map of the Baouchriyeh site area.



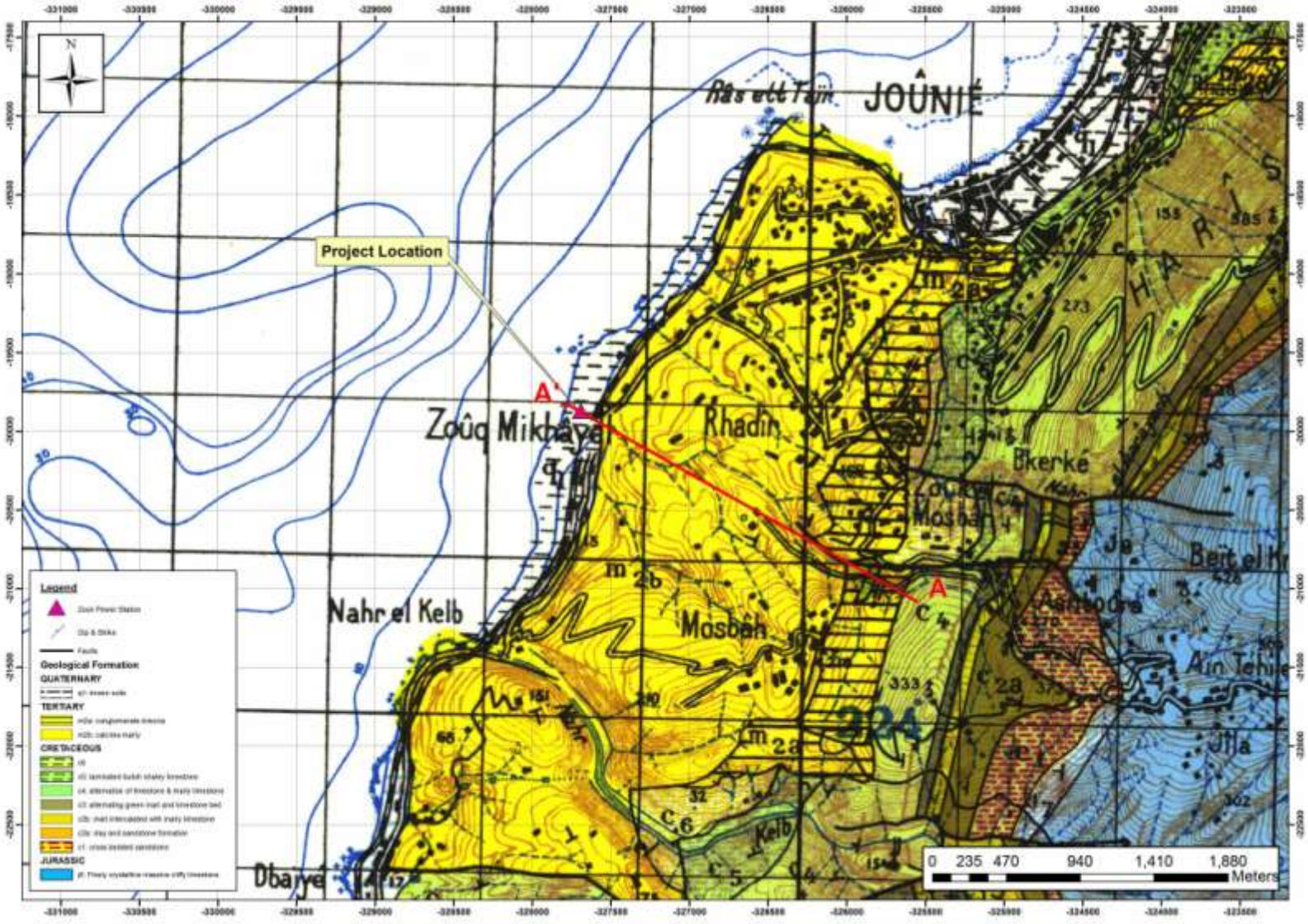
Map 7: General topographic map of the Jiyeh site area.



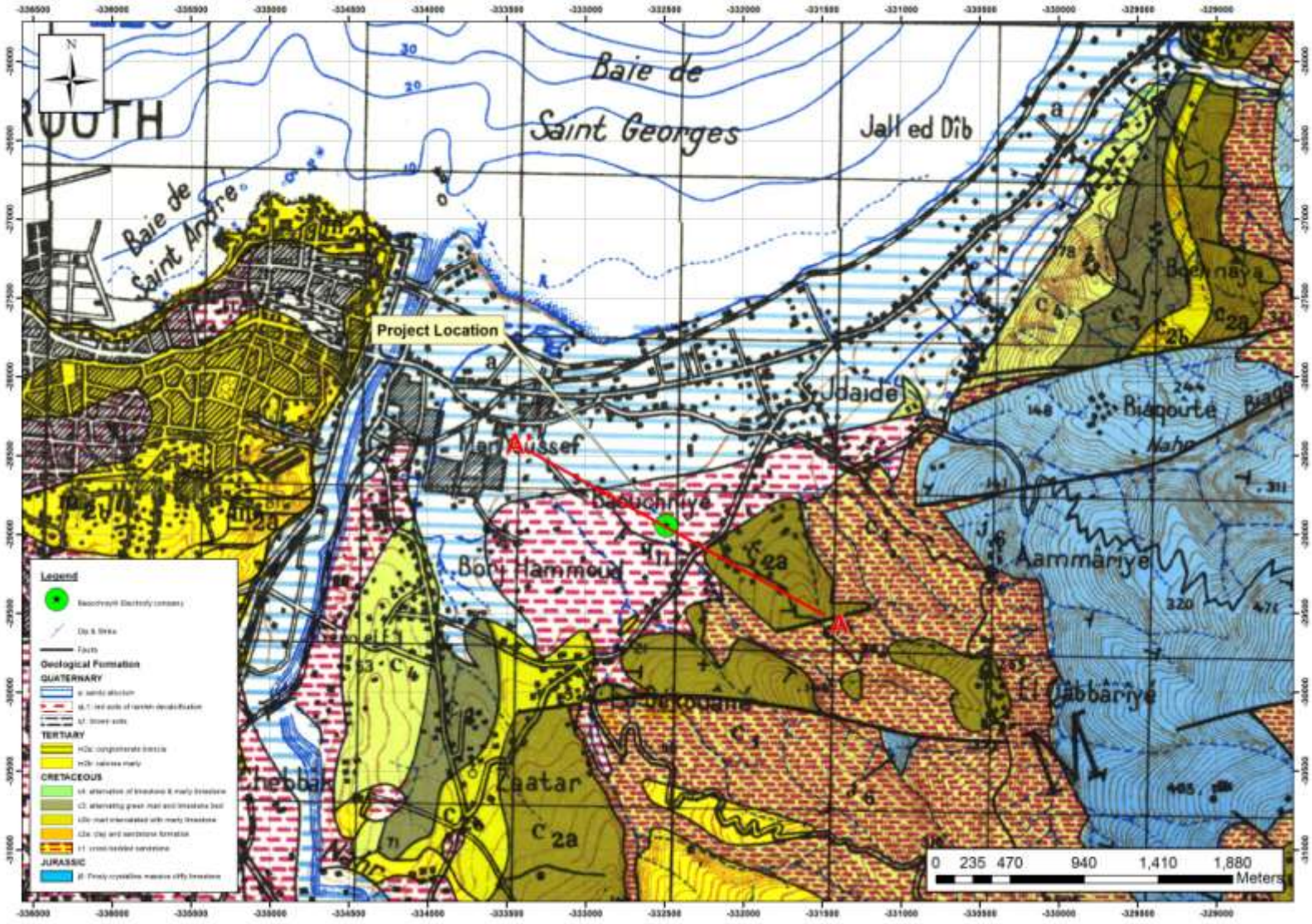
Map 8: Map of the road leading to Zouk site.

Map 9: Map of the road leading to Baouchriyeh site.

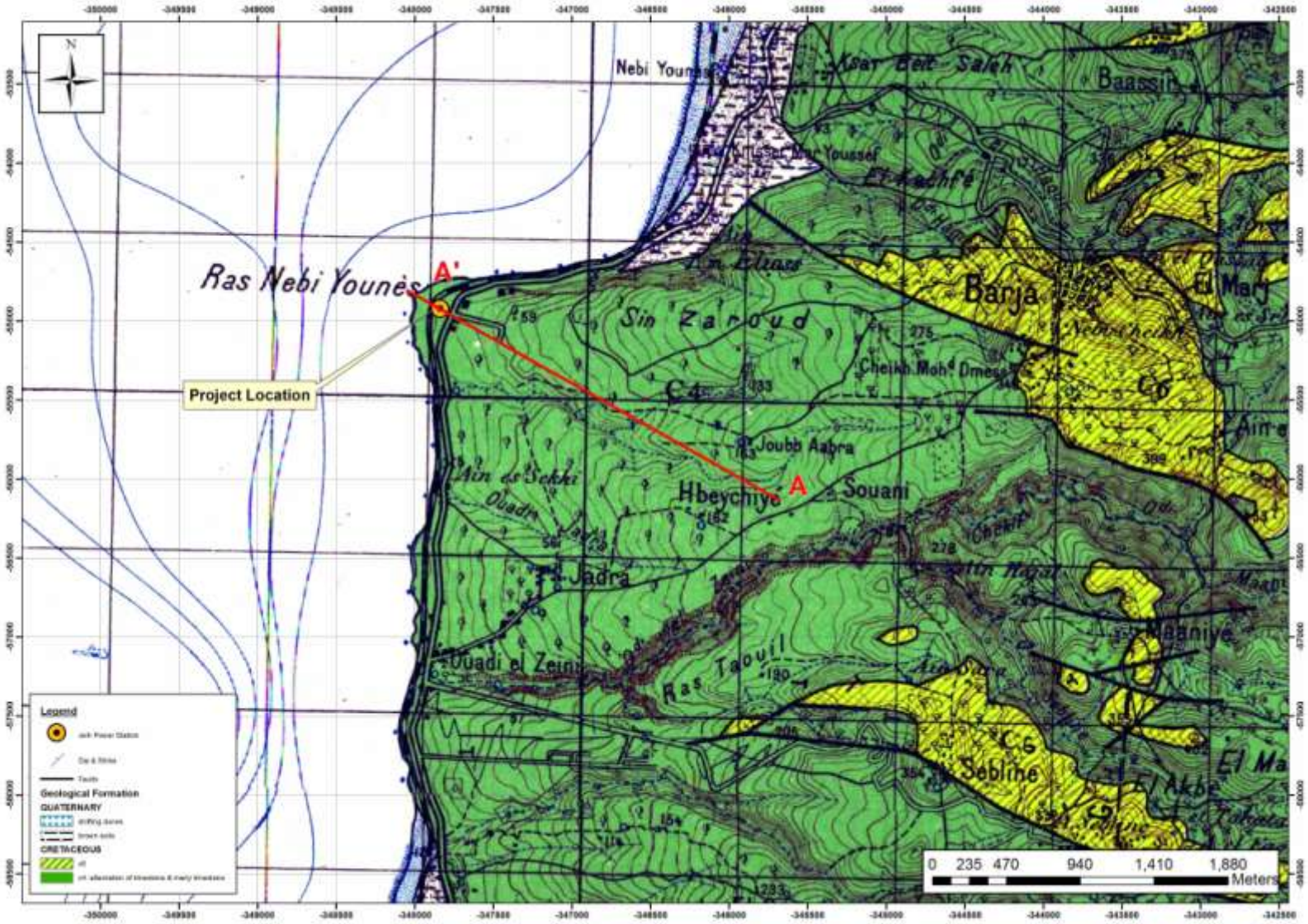
Map 10: Map of the road leading to Jiyeh site.



Map 11: General Geological map of Zouk site and surrounding area.



Map 12: General Geological map of Baouchriyeh site and surrounding area.



Map 13: General Geological map of Jiyeh site and surrounding area.

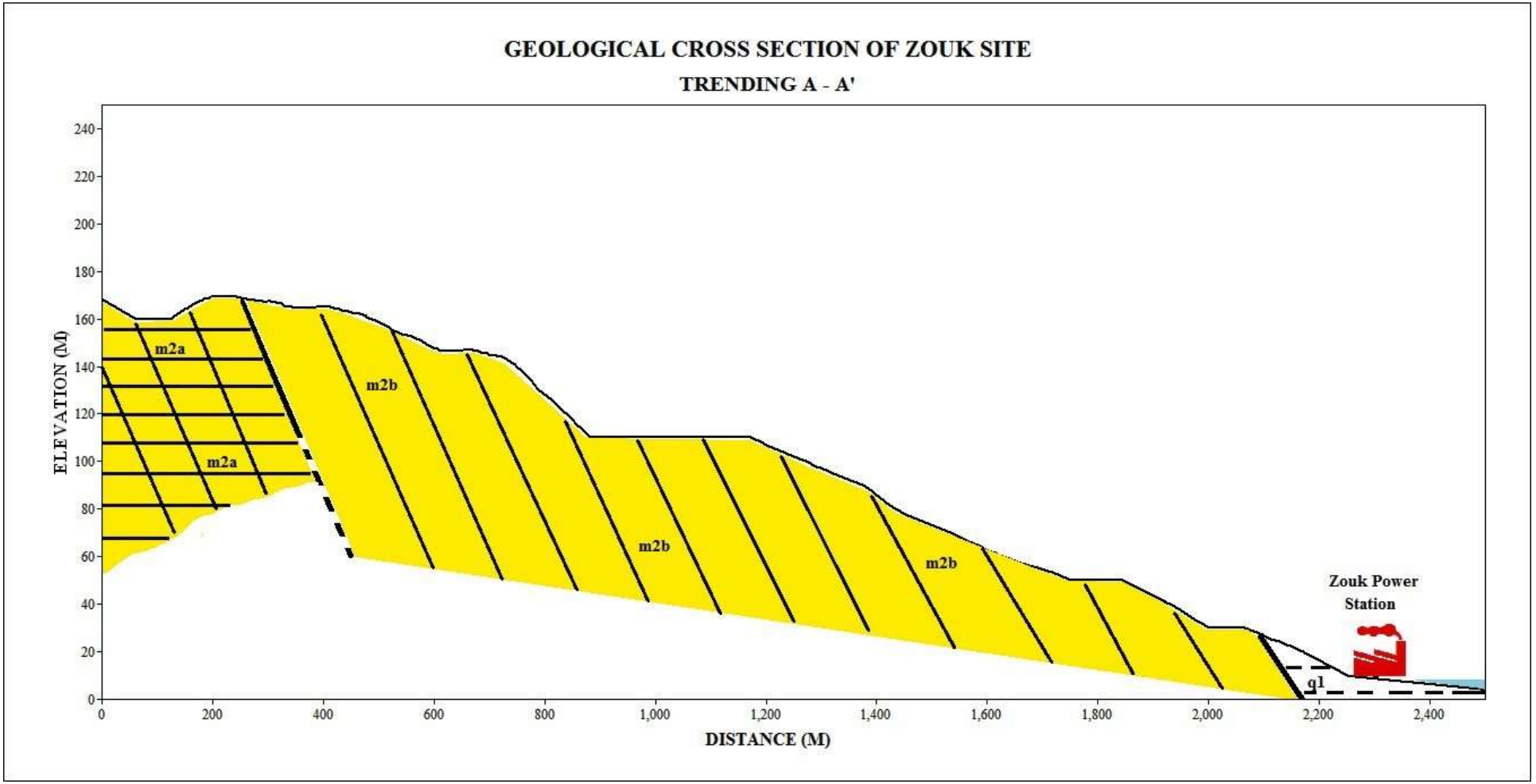


Figure B: Geological cross section for Zouk area.

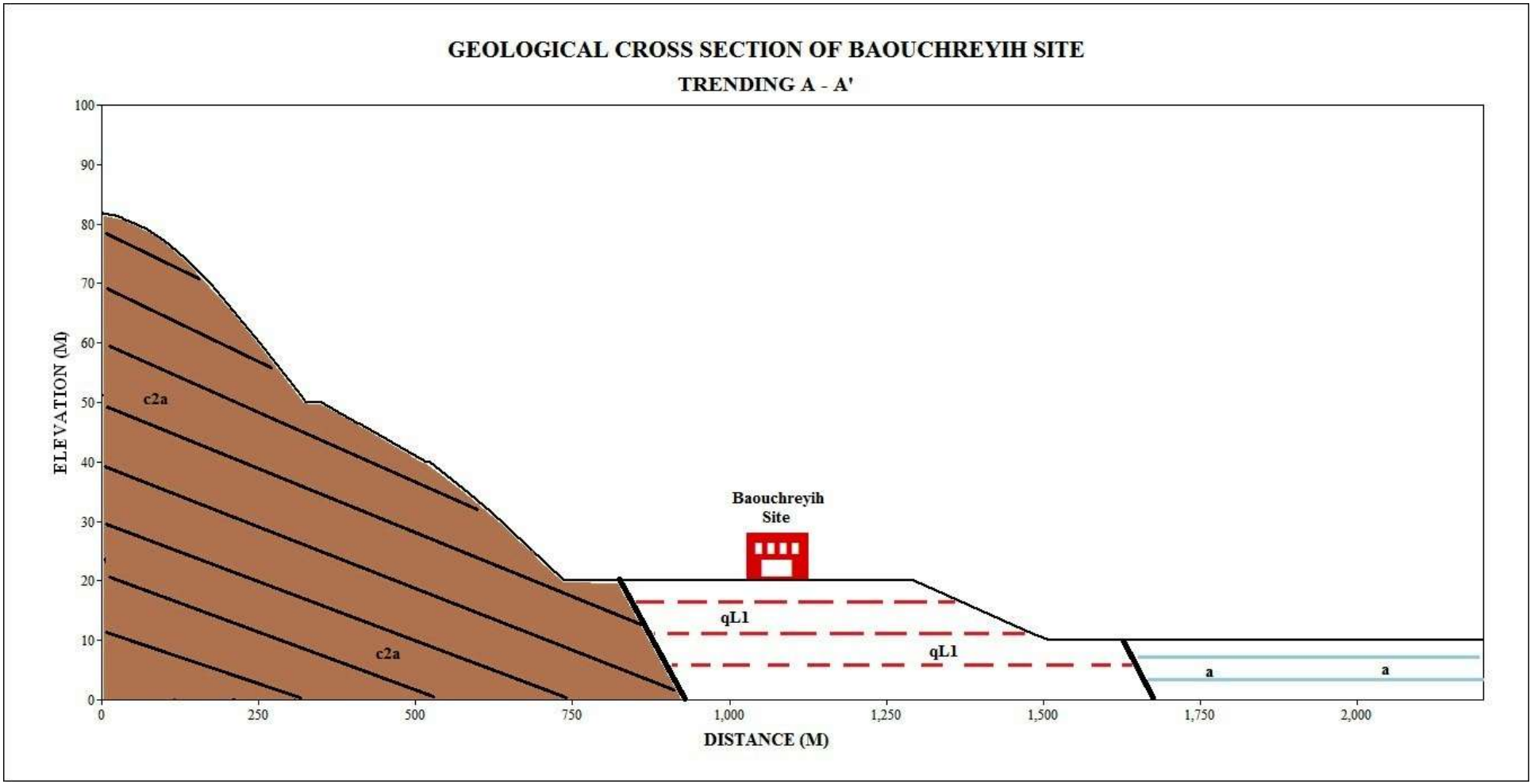


Figure C: Geological cross section for Baouchriyeh area.

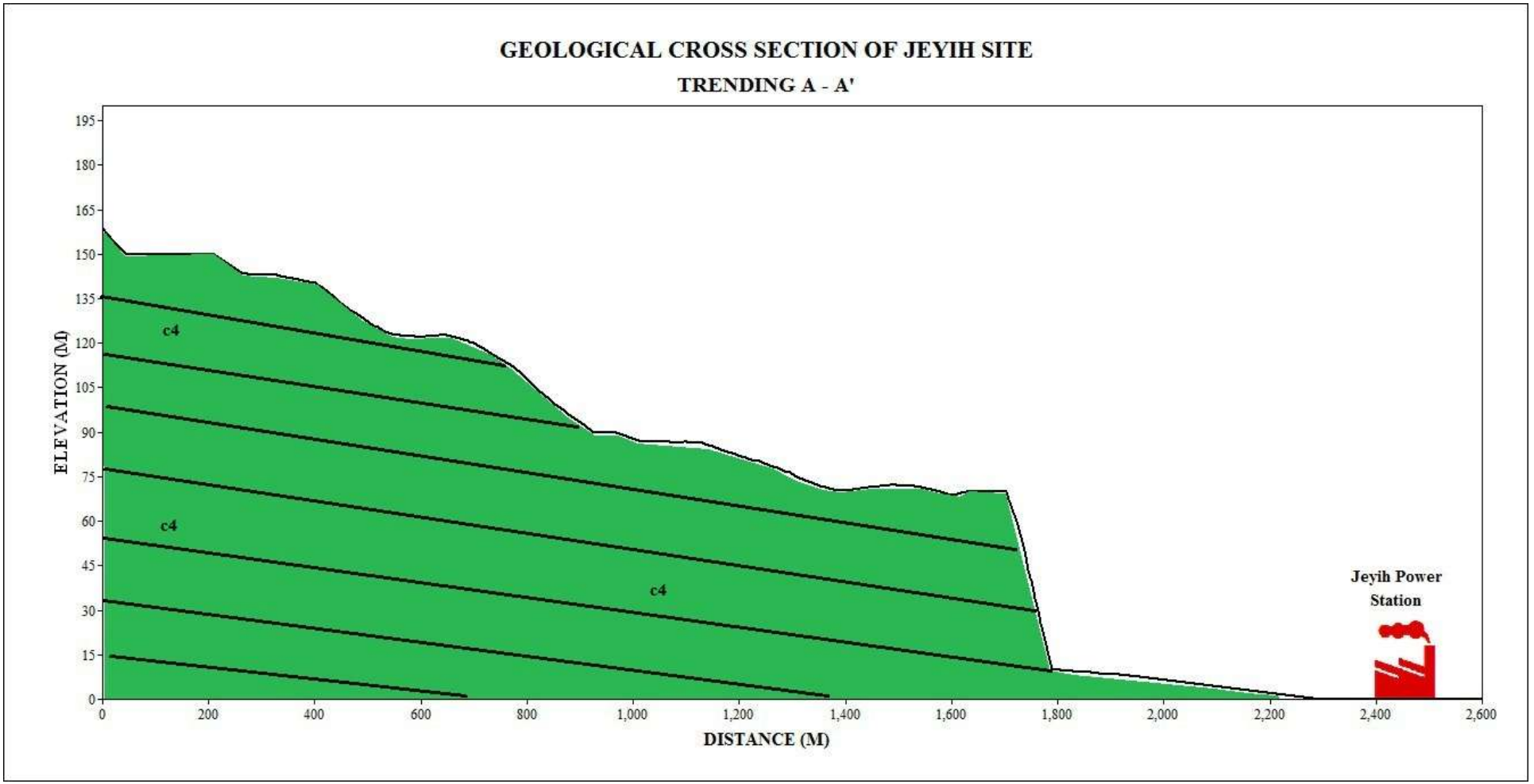


Figure D: Geological cross section for Jiyeh area.

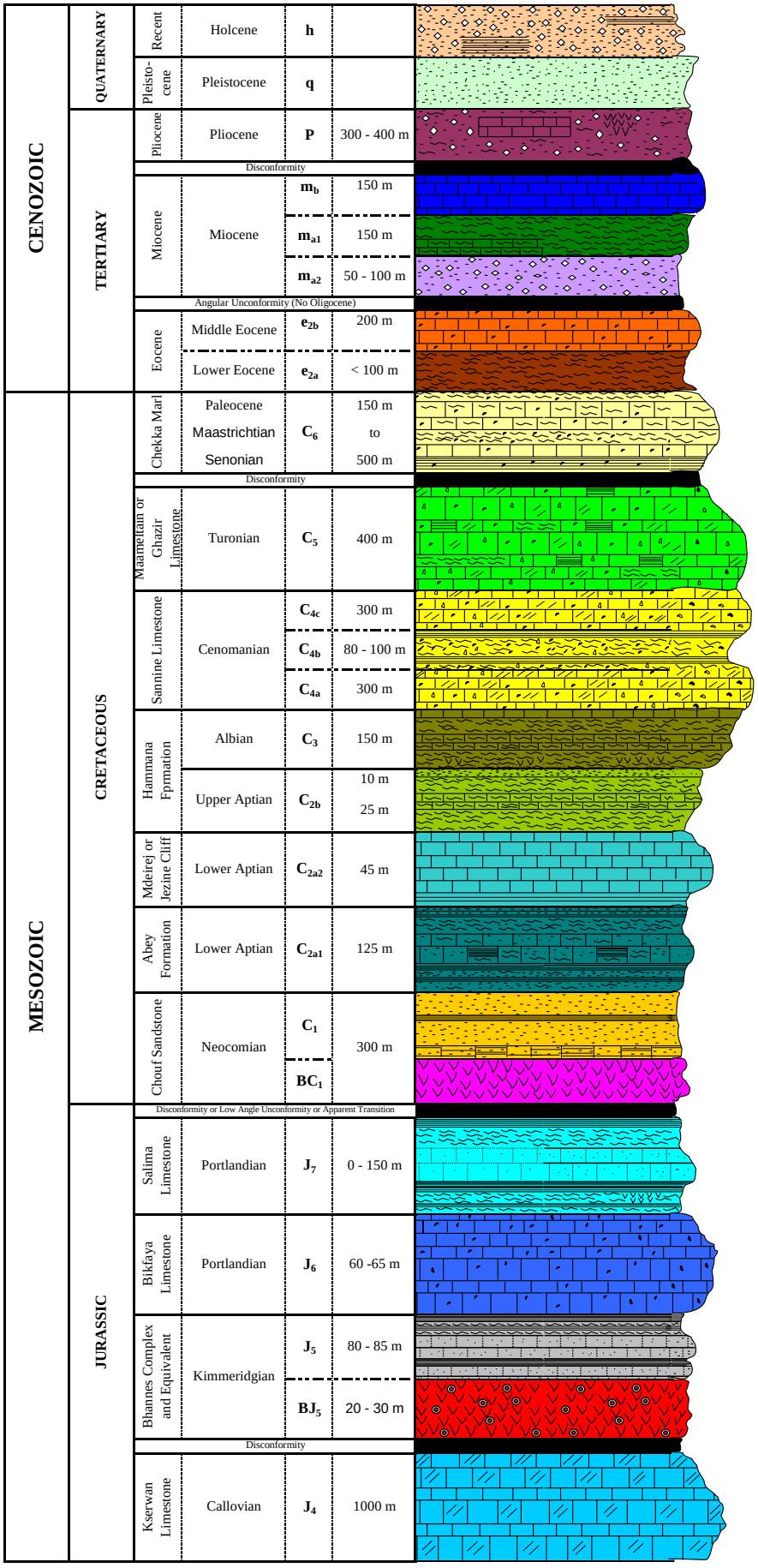
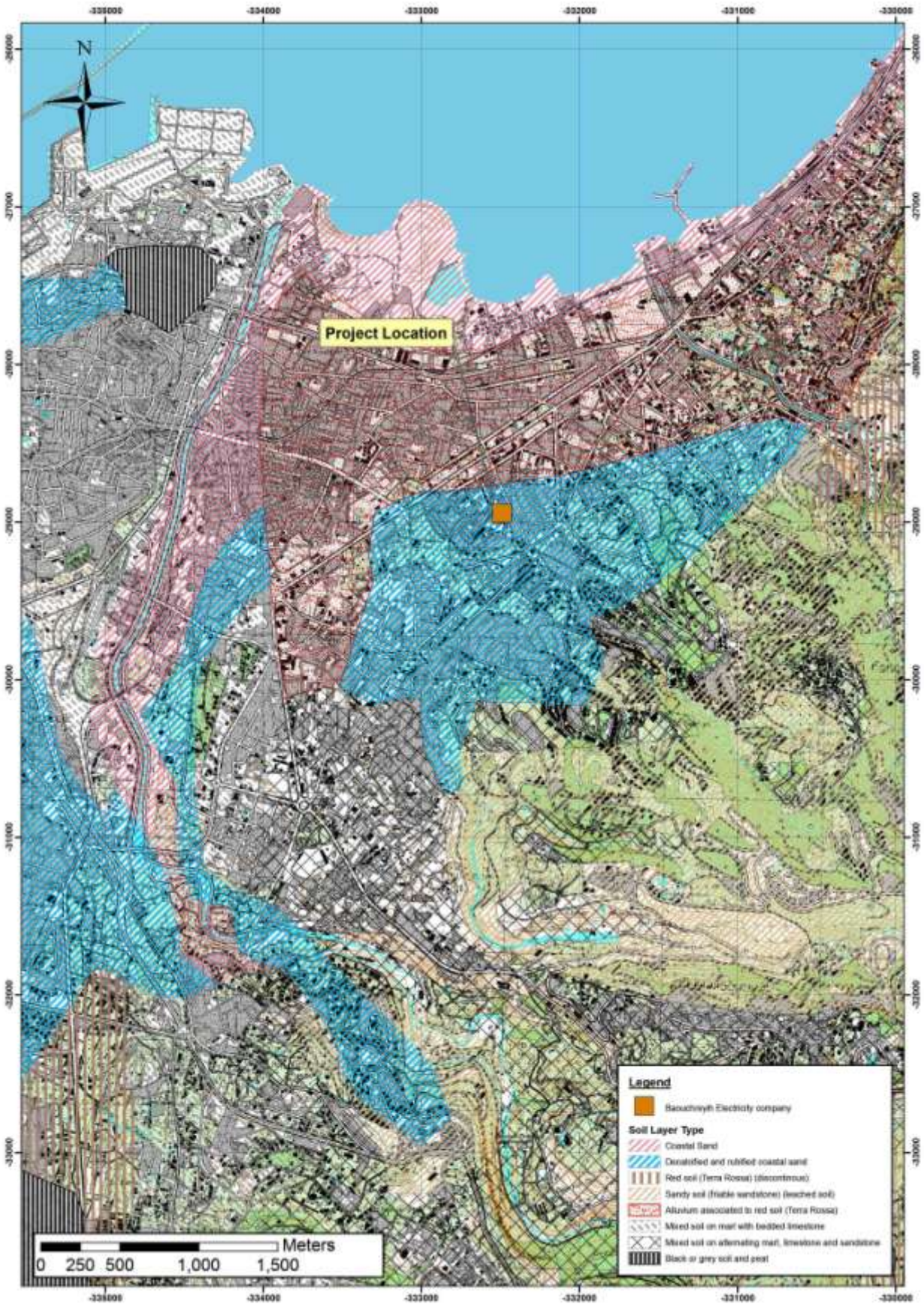
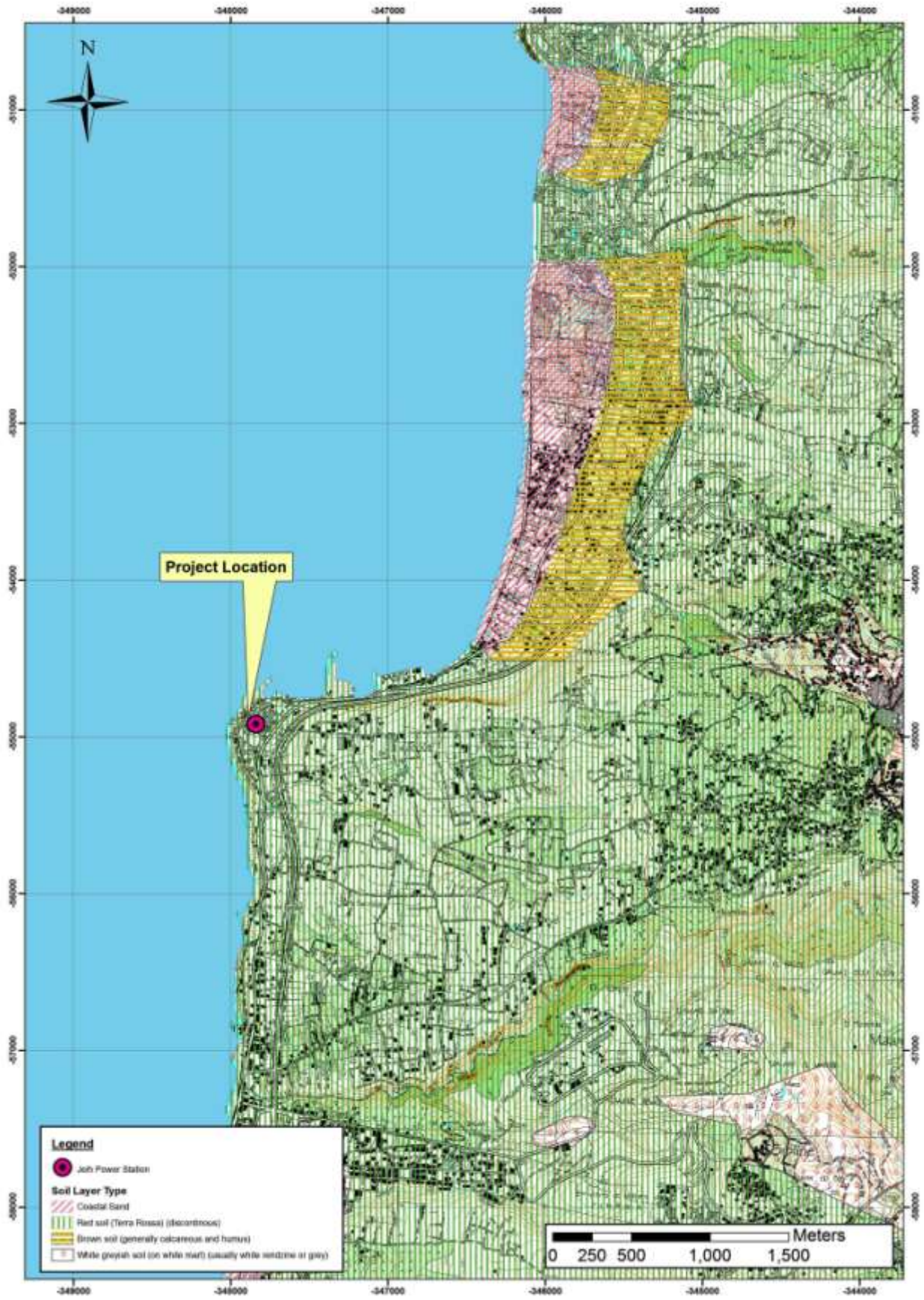


Figure E. Geological Formations of Lebanon (Geoflint).

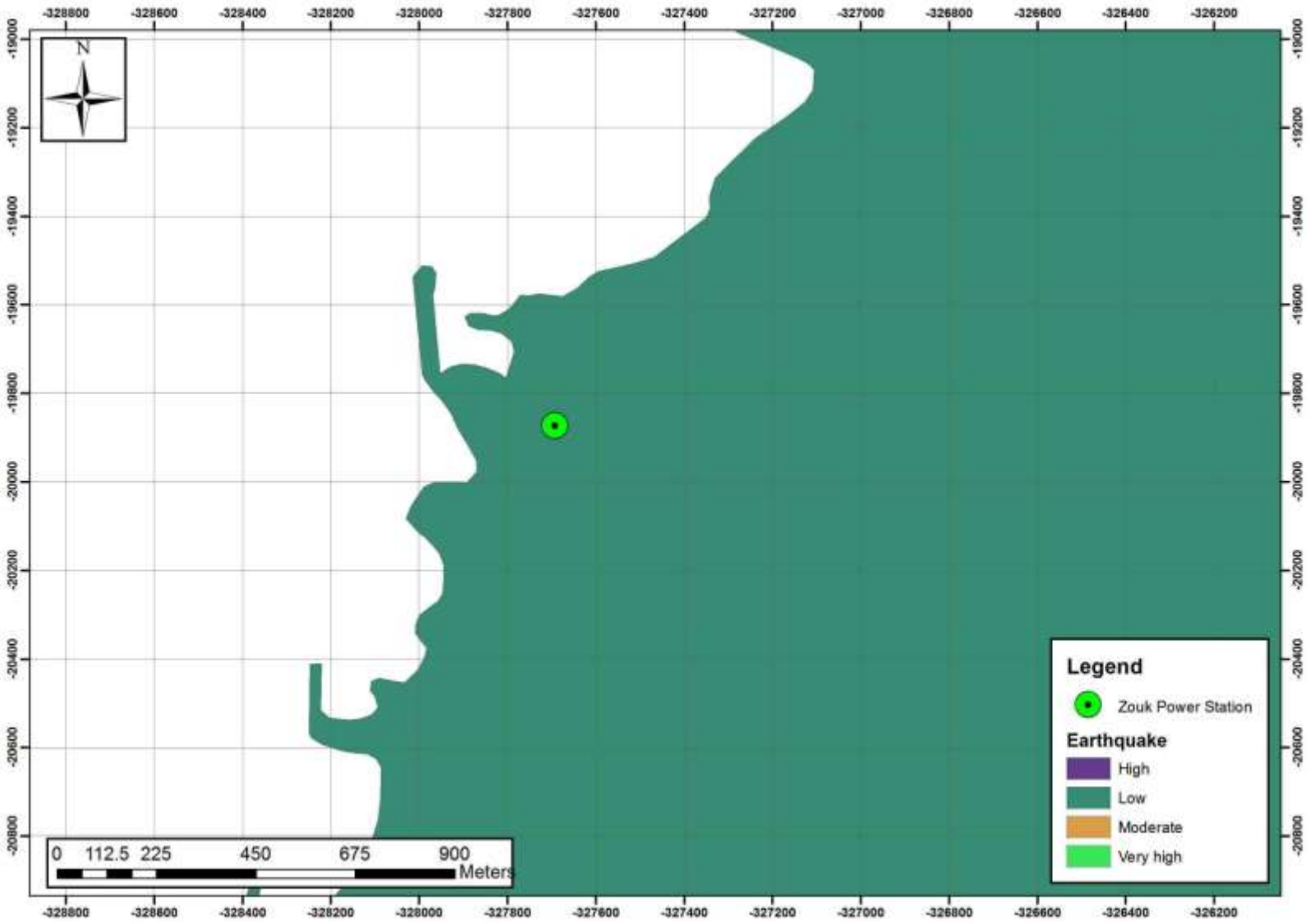
Map 14: General Soil map of Zouk site and surrounding area.



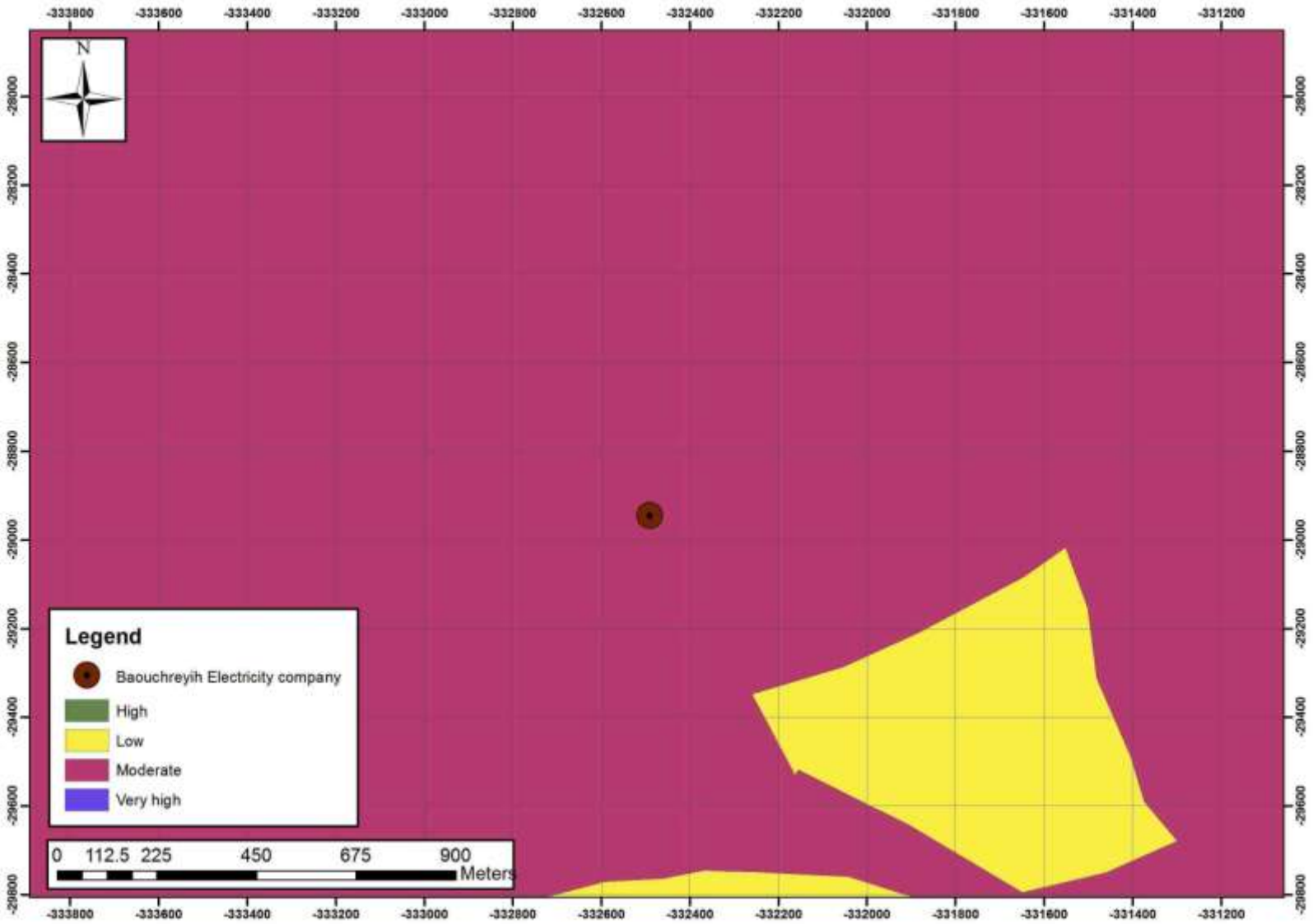
Map 15: General Soil map of Baouchriyeh site and surrounding area.



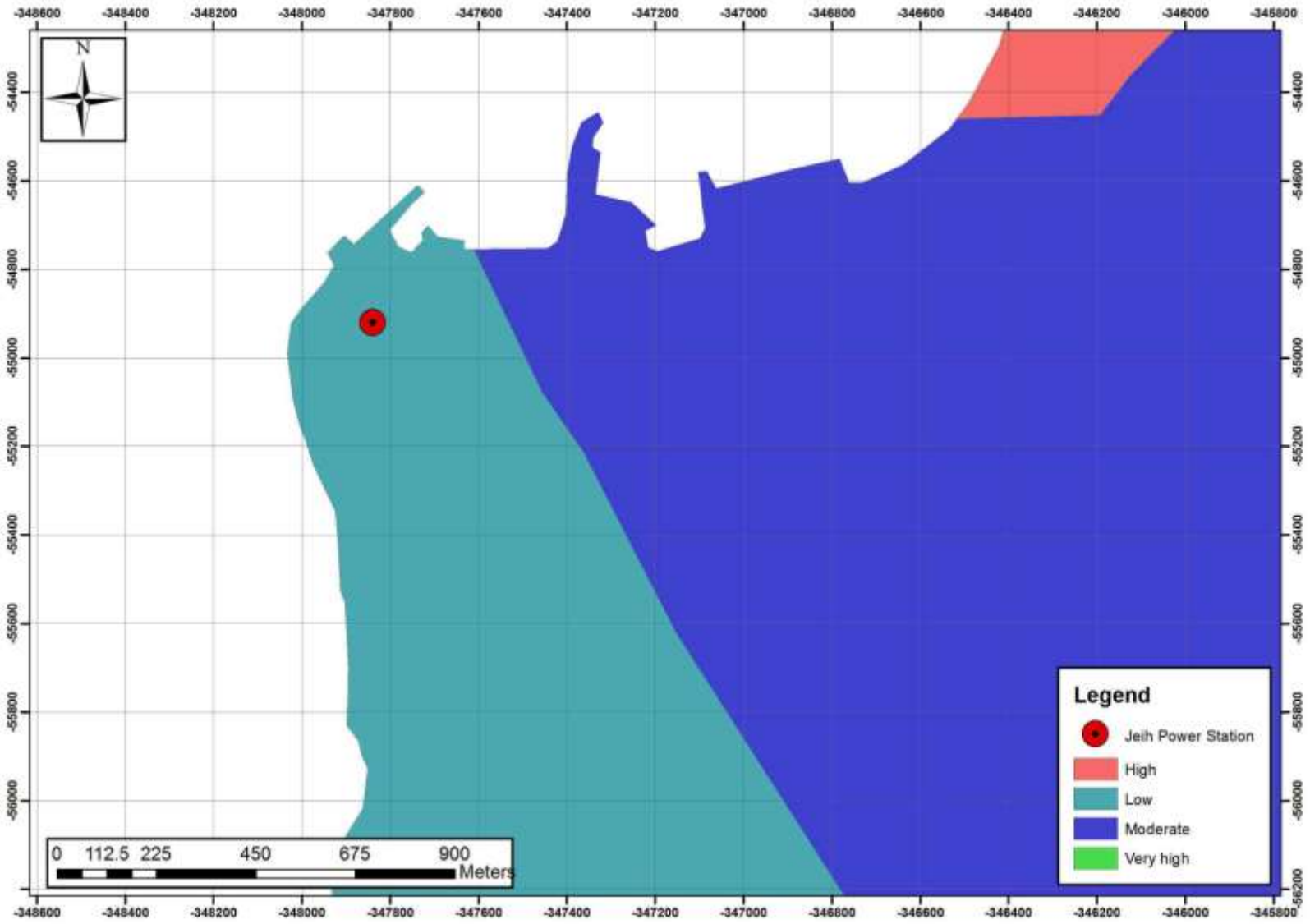
Map 16: General Soil map of Jiyeh site and surrounding area.



Map 17: Seismic map of Zouk site and surrounding areas.

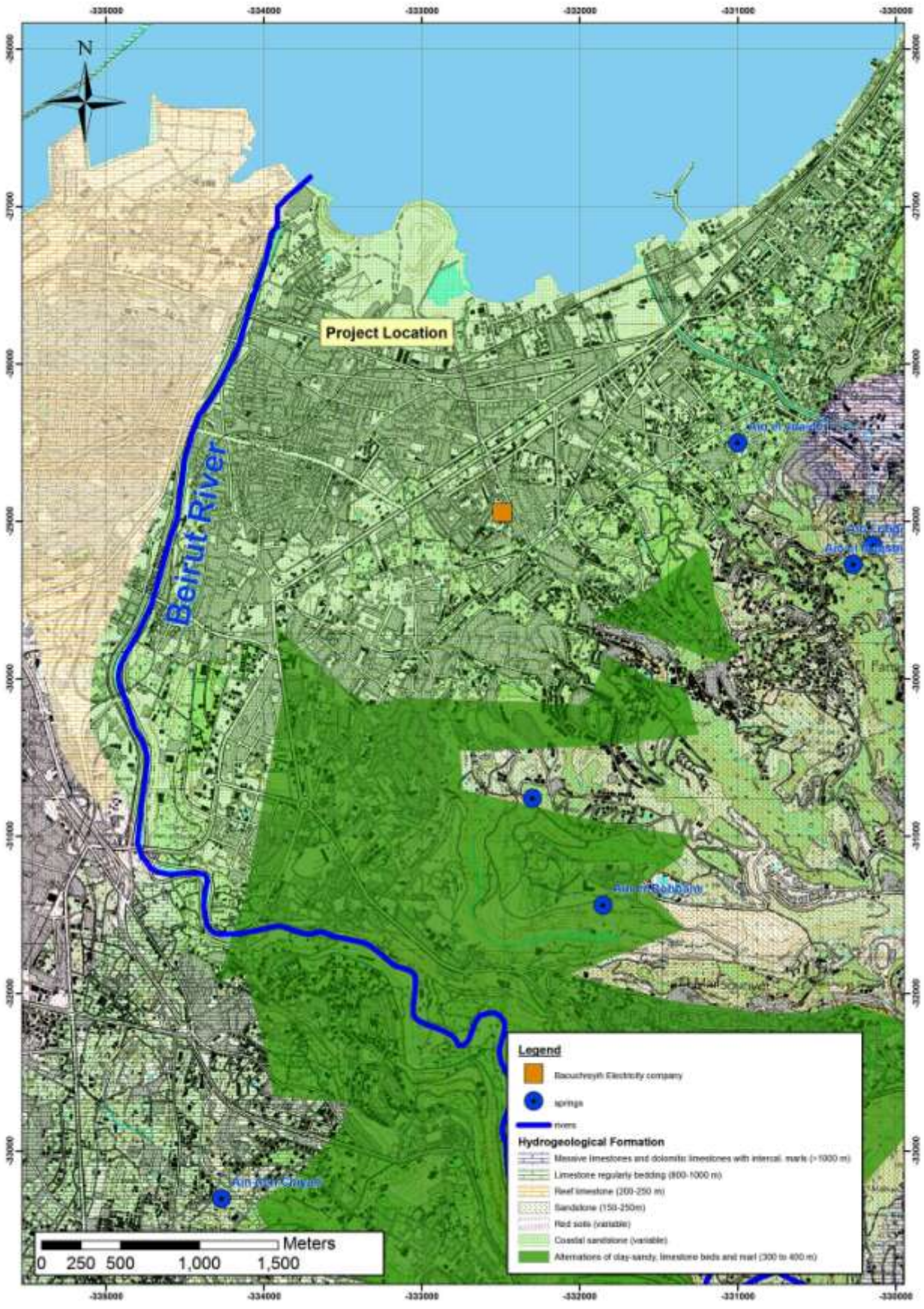


Map 18: Seismic map of Baouchriyeh site and surrounding areas.



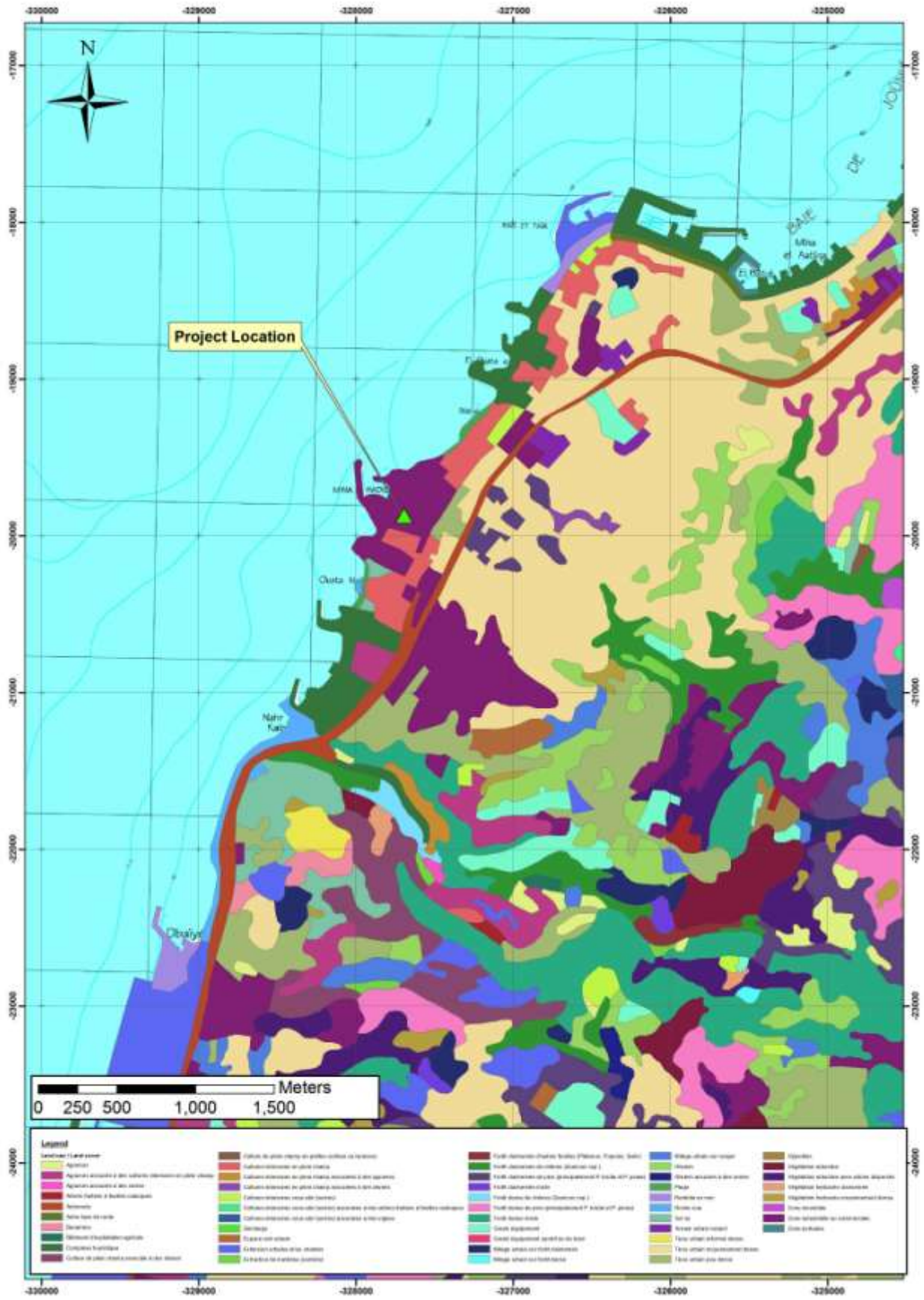
Map 19: Seismic map of Jiyeh site and surrounding areas.

Map 20: Hydrogeological map of Zouk site and surrounding areas.

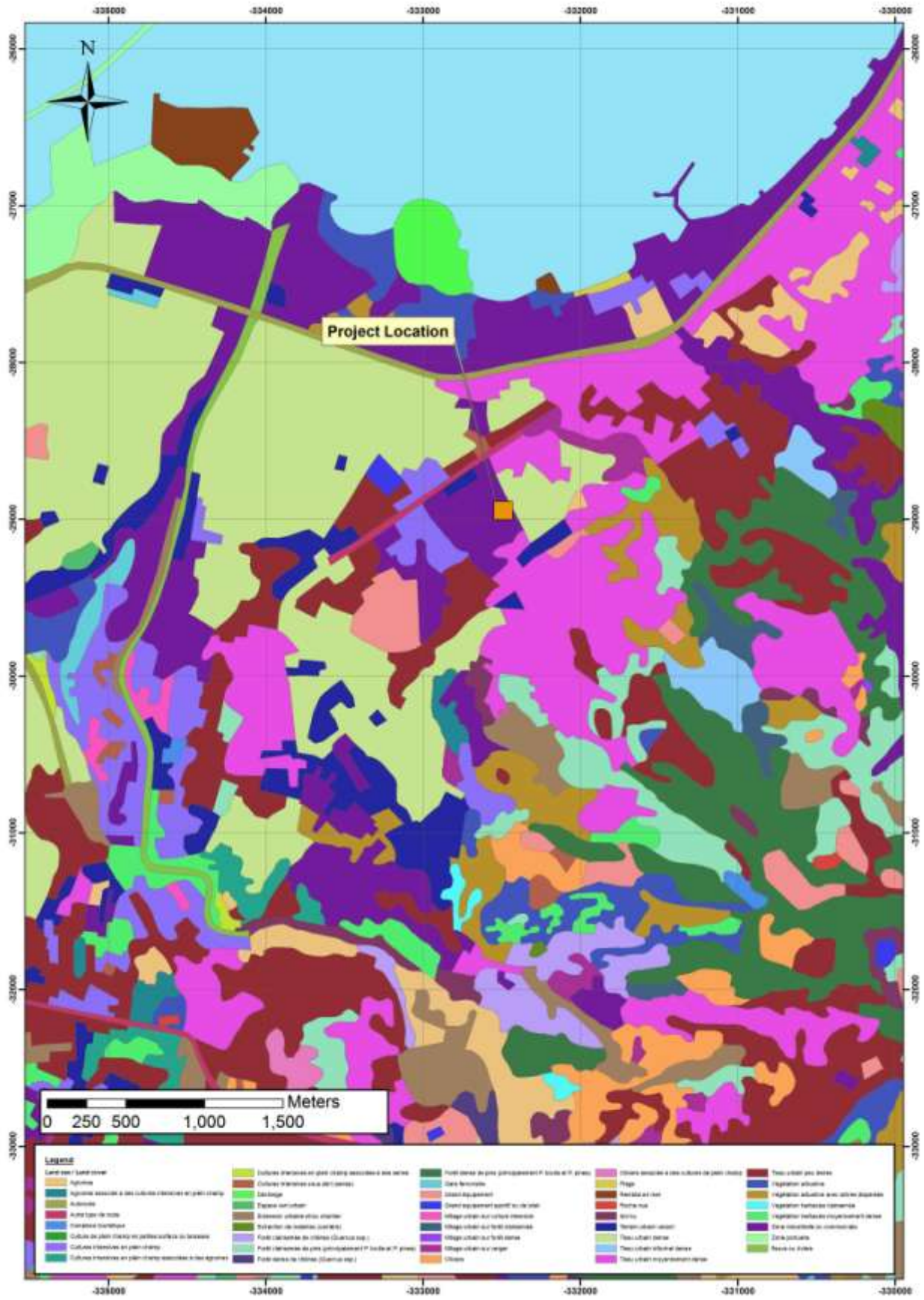


Map 21: Hydrogeological map of Baouchriyeh site and surrounding areas.

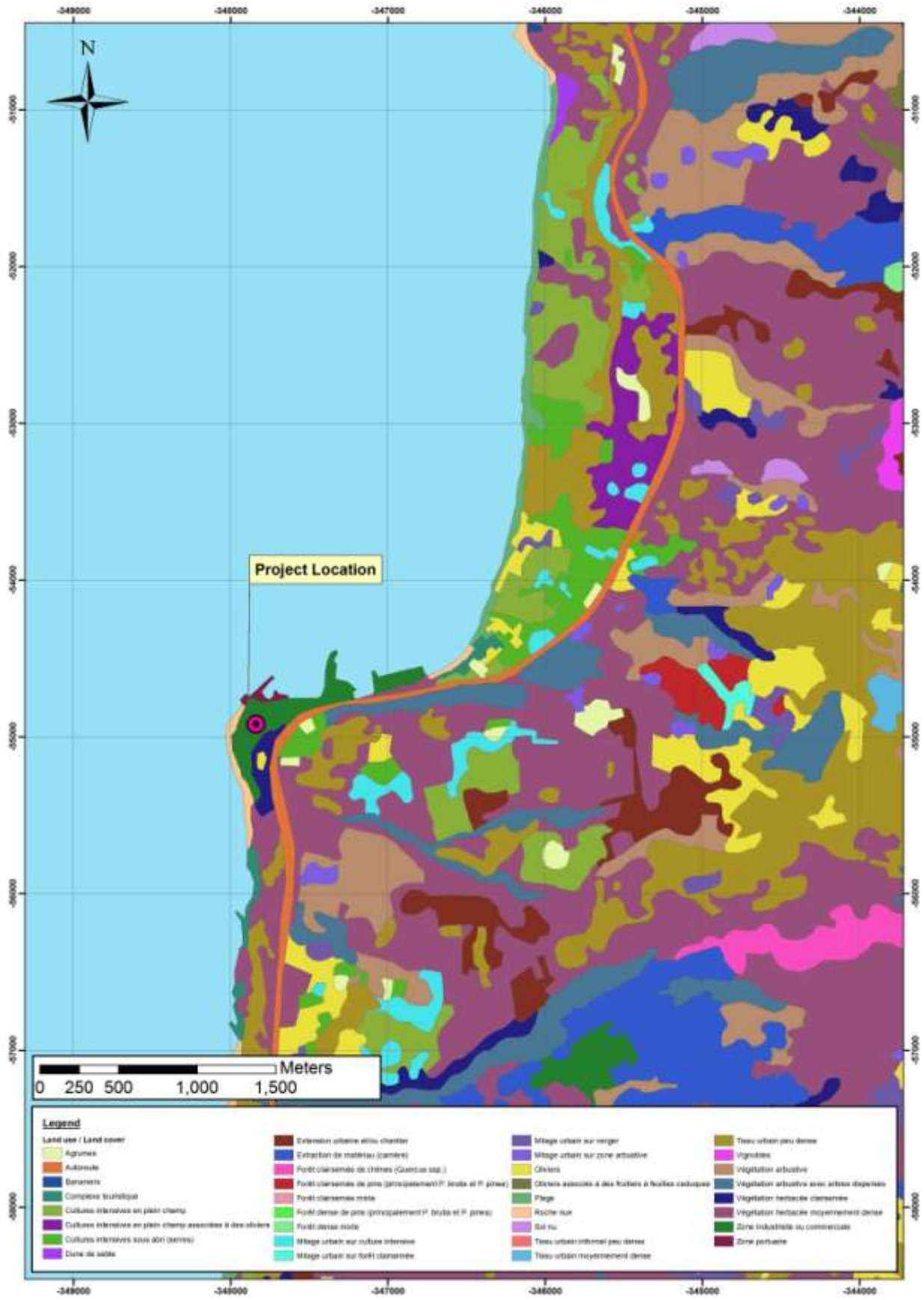
Map 22: Hydrogeological map of Jiyeh site and surrounding areas.



Map 23: Land cover – land use map of Zouk site and surrounding area.



Map 24: Land cover – land use map of Baouchriyeh site and surrounding area.



Map 25: Land cover – land use map of Jiyeh site and surrounding area.

APPENDIX 6

Meteorological and Climate Data

1 Precipitation rates

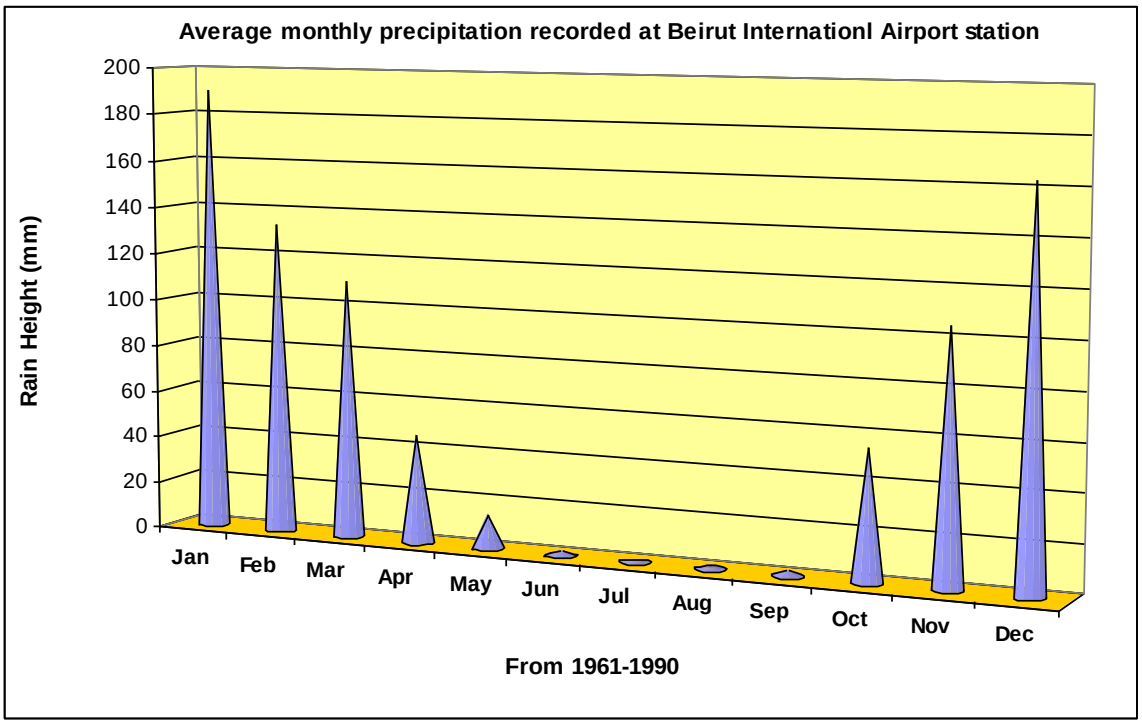


Chart 1: Average monthly precipitation recorded at RHBIA station from 1961 until 1990.

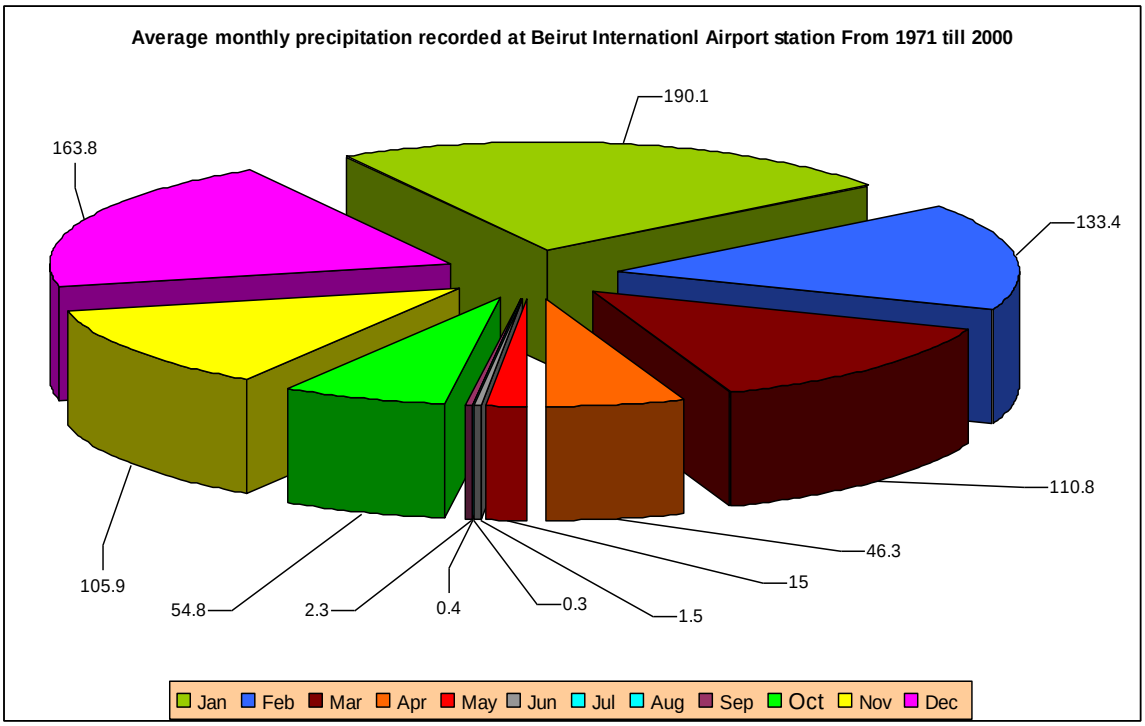


Chart 2: Average monthly precipitation recorded at RHBIA station from 1971 until 2000.

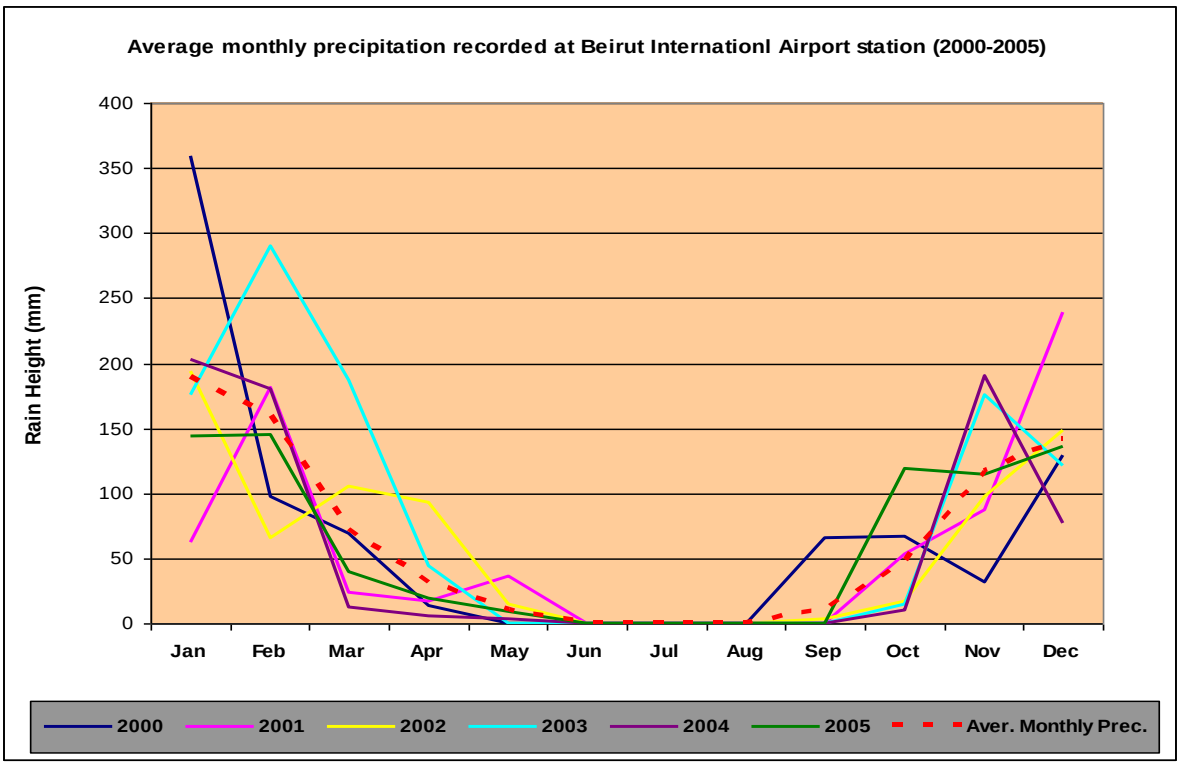


Chart 3: Average monthly precipitation recorded at RHBIA station from 2000 until 2005.

Month	Number of days with thunderstorms	Number of days with fog	Number of days of precipitation	Number of days when the sea calms
January	**5**	**0**	**16**	**19**
February	**4**	**1**	**13**	**18**
March	**4**	**2**	**11**	**21**
April	**2**	**2**	**6**	**21**
May	**1**	**3**	**3**	**23**
June	**0**	**2**	**1**	**22**
July	**0**	**1**	**0**	**20**
August	**0**	**1**	**0**	**24**
September	**0**	**2**	**1**	**25**
October	**2**	**1**	**6**	**27**
November	**4**	**1**	**9**	**22**
December	**4**	**0**	**14**	**20**
Total	**26**	**16**	**80**	**262**

Table A: Average days of thunderstorms, fog, precipitation, calm sea at RHBIA 1971-2000.

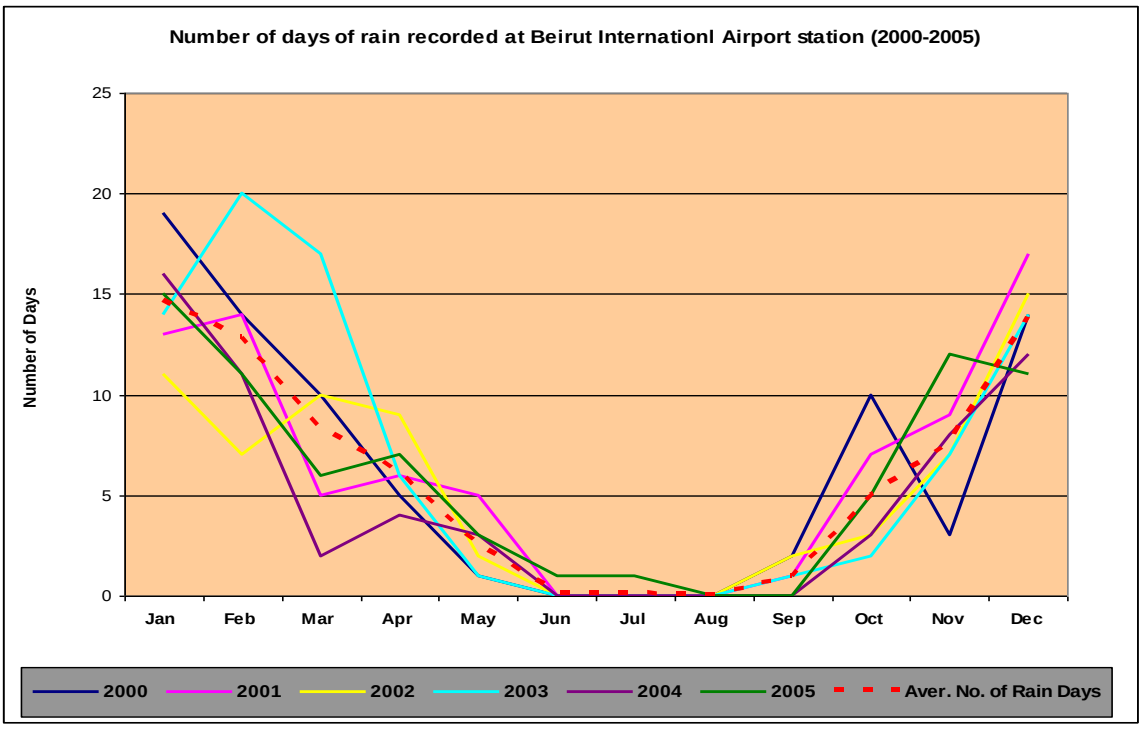


Chart 4: Average number of rainy days recorded at RHBIA station from 2000 until 2005.

2. Wind records

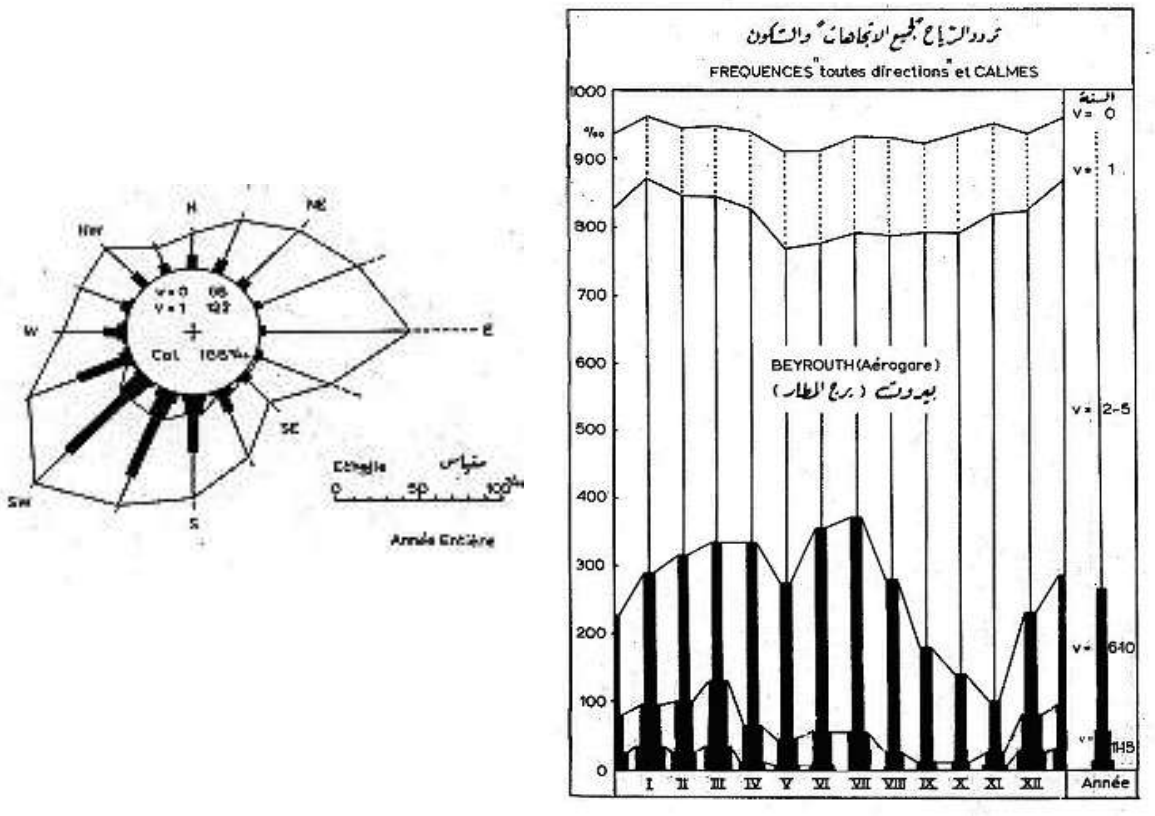


Figure A: Average wind speed and direction over a thirty-year period as recorded at RHBIA station.

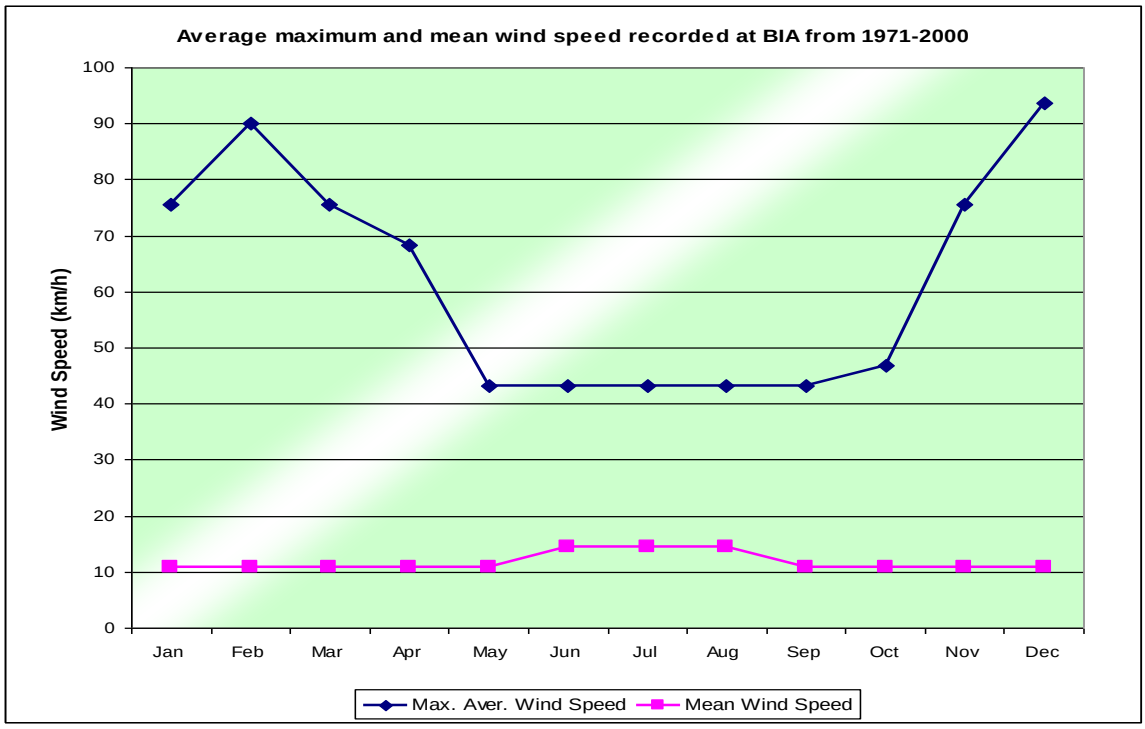


Chart 5: Average maximum and mean monthly wind speed recorded at RHBIA (1971-2000).

Month of year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM
	01	02	03	04	05	06	07	08	09	10	11	12	1-12
Dominant Wind dir													
Wind probability > = 4 Beaufort (%)	20	24	20	20	17	20	25	11	10	9	9	16	**16**
Average Wind speed (Km/h)	13	15	15	15	15	15	17	13	13	11	11	13	**13**
Average air temp. (°C)	16	16	18	21	24	27	29	30	29	26	21	18	**22**

Table B: Wind statistics based on observations taken between 6/2005 - 5/2012.

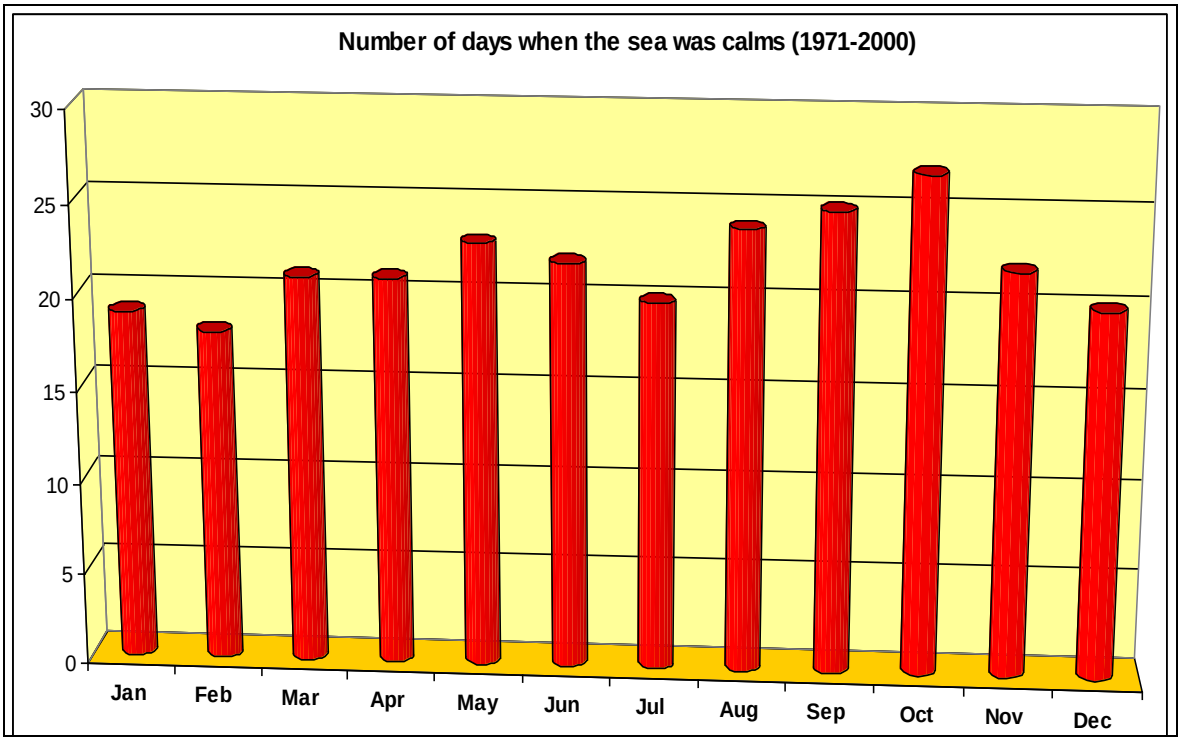


Chart 6: Average number of days when the sea was calms recorded at RHBIA (1971-2000).

3. Temperature

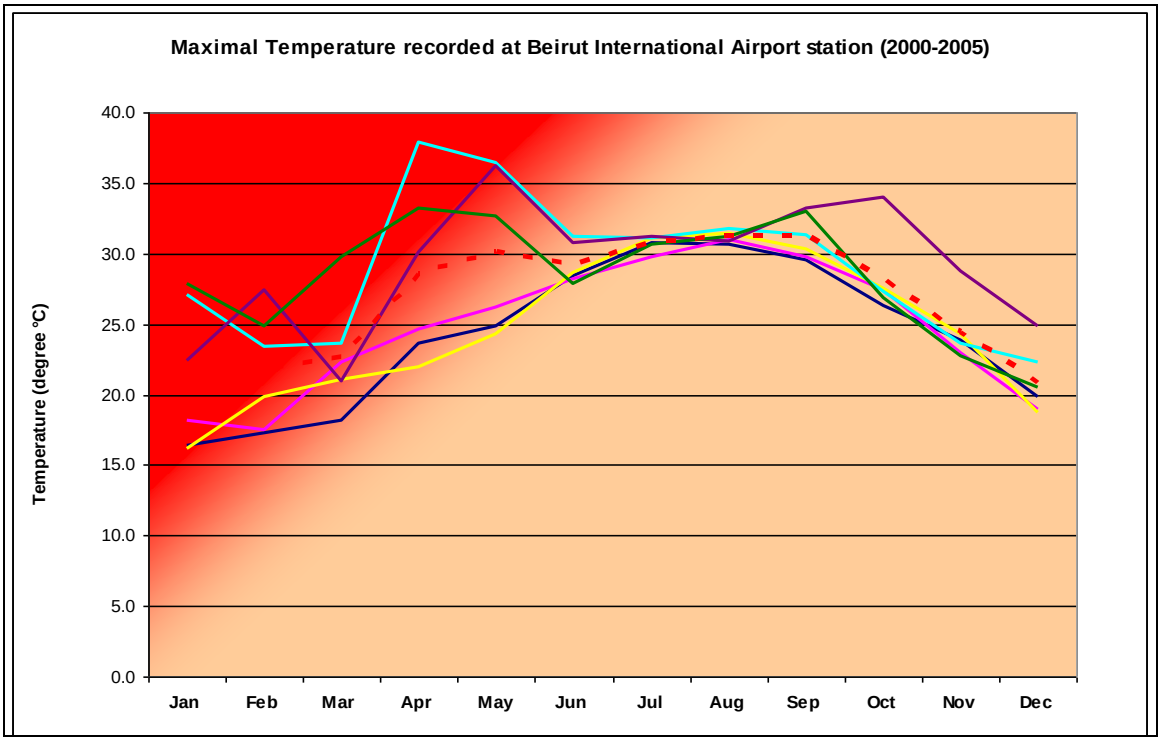


Chart 7: Average maximum monthly temperature record at RHBIA station (2000 to 2005).

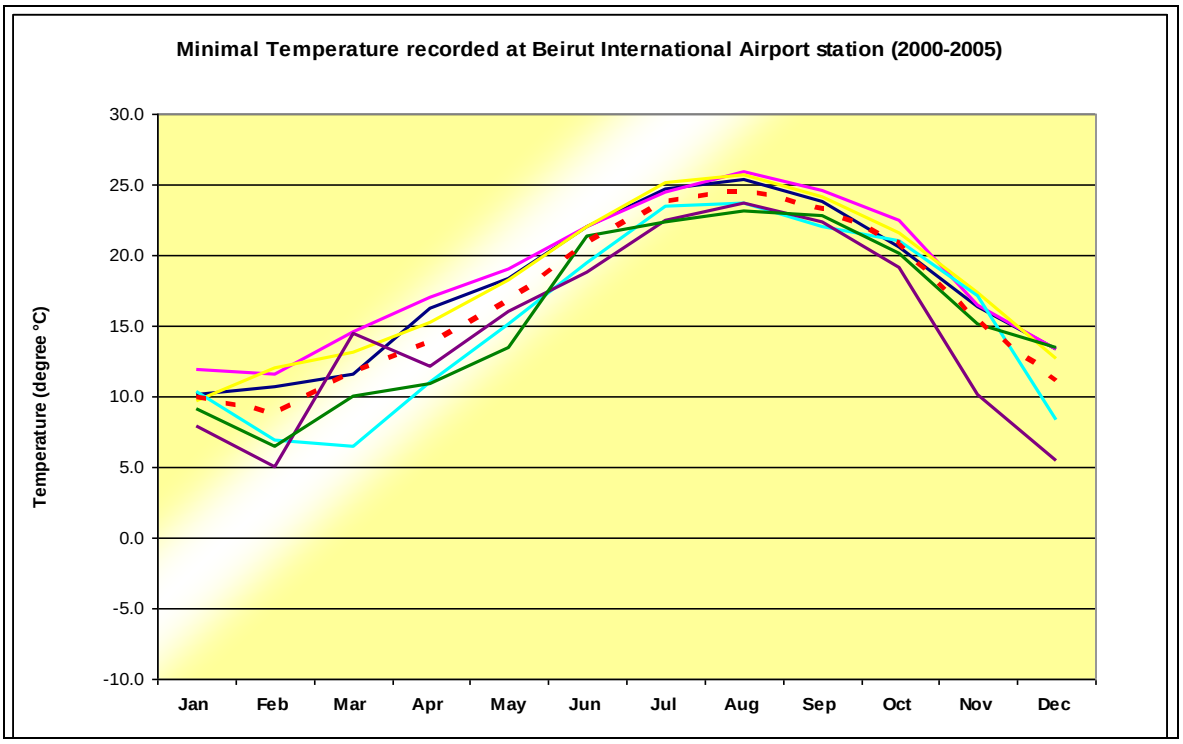


Chart 8: Average minimum monthly temperature record at RHBIA station (2000 to 2005).

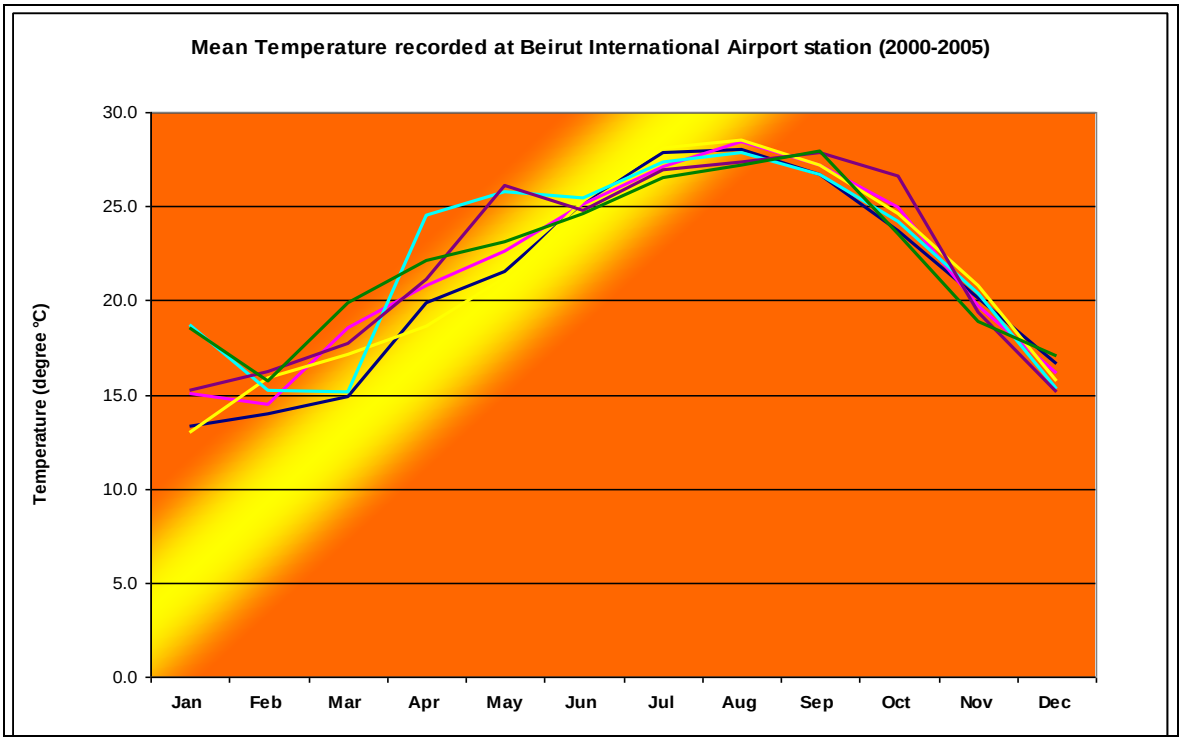


Chart 9: Mean monthly temperature record at RHBIA station (from 2000 to 2005).

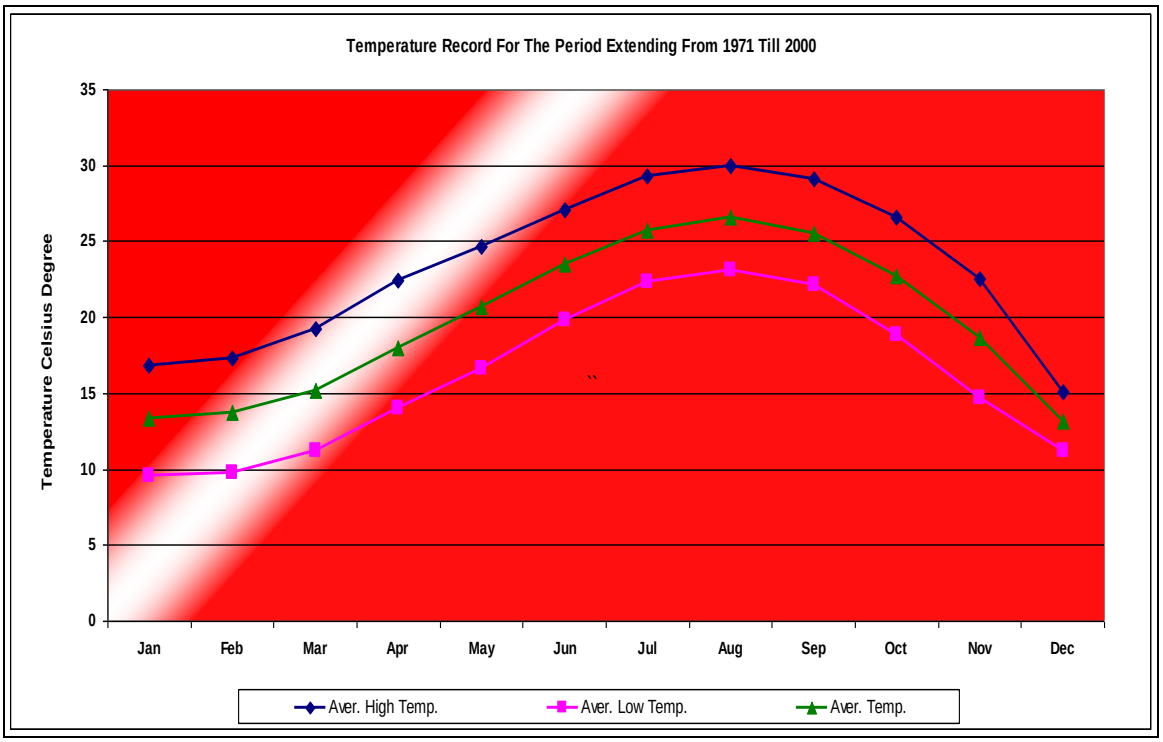


Chart 10: Average, High and Low monthly temperature record at RHBIA (1971 - 2000).

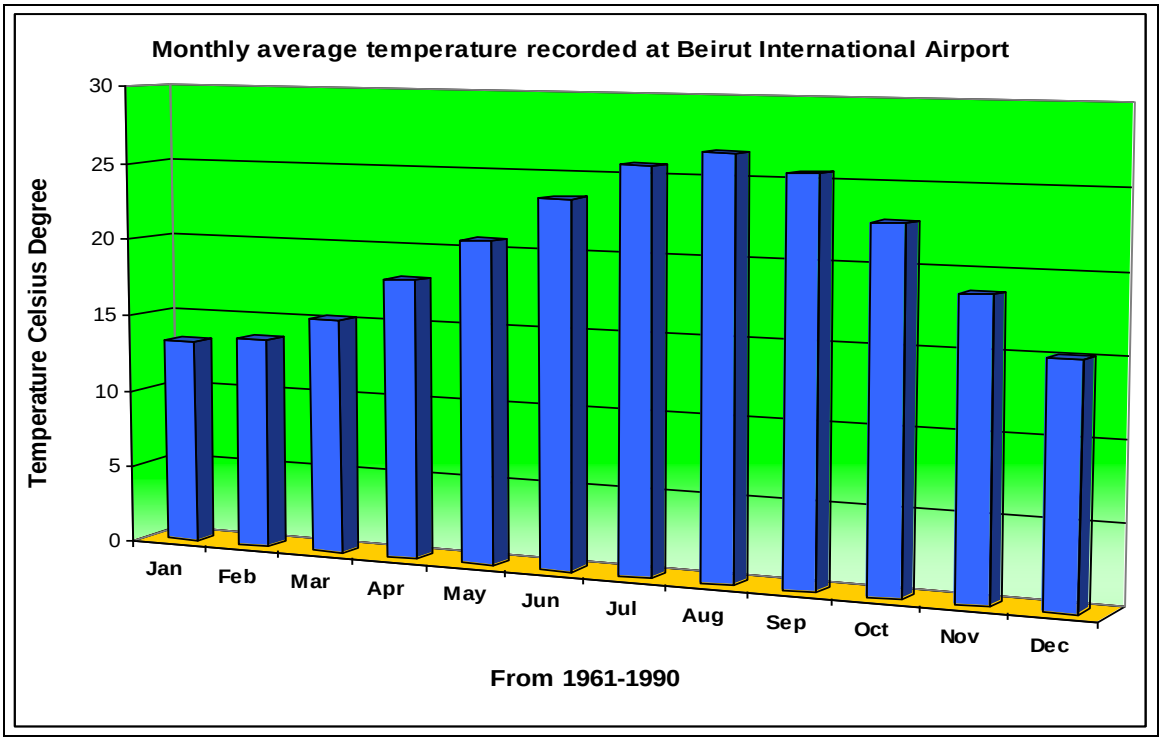


Chart 11: Average monthly temperature record at RHBIA station (from 1961 to 1990).

4. Relative Humidity

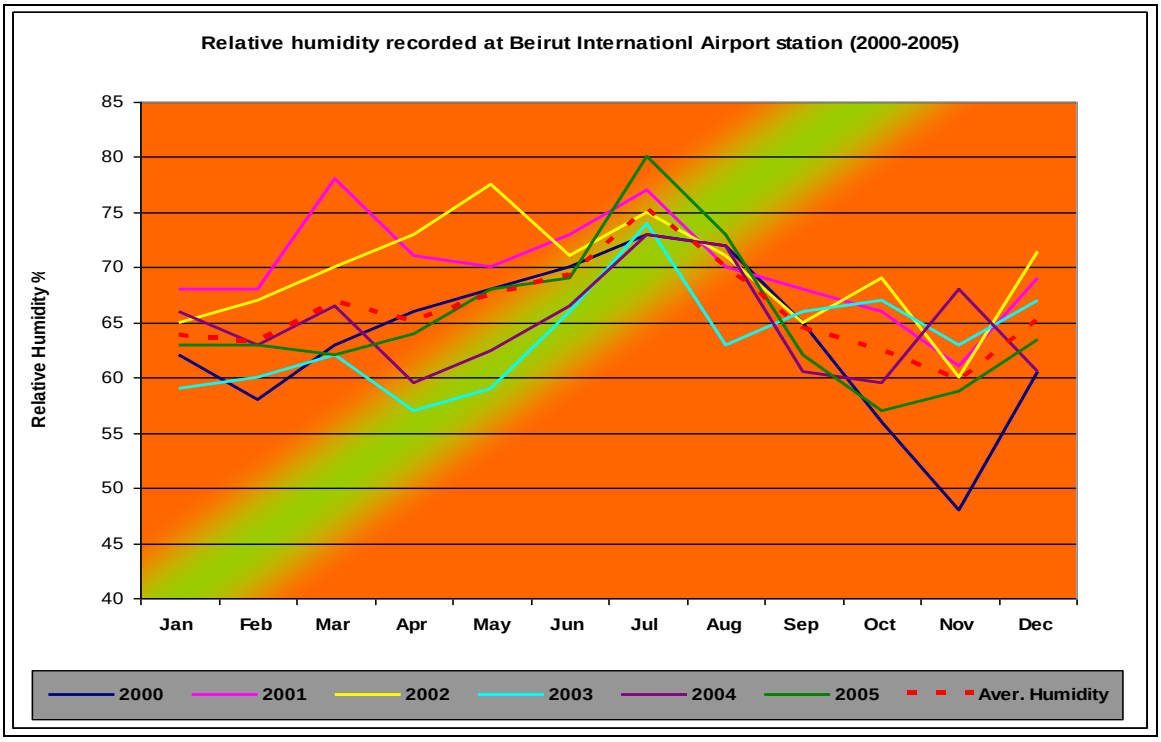


Chart 12: Average monthly relative humidity record at RHBIA station (2000 until 2005).

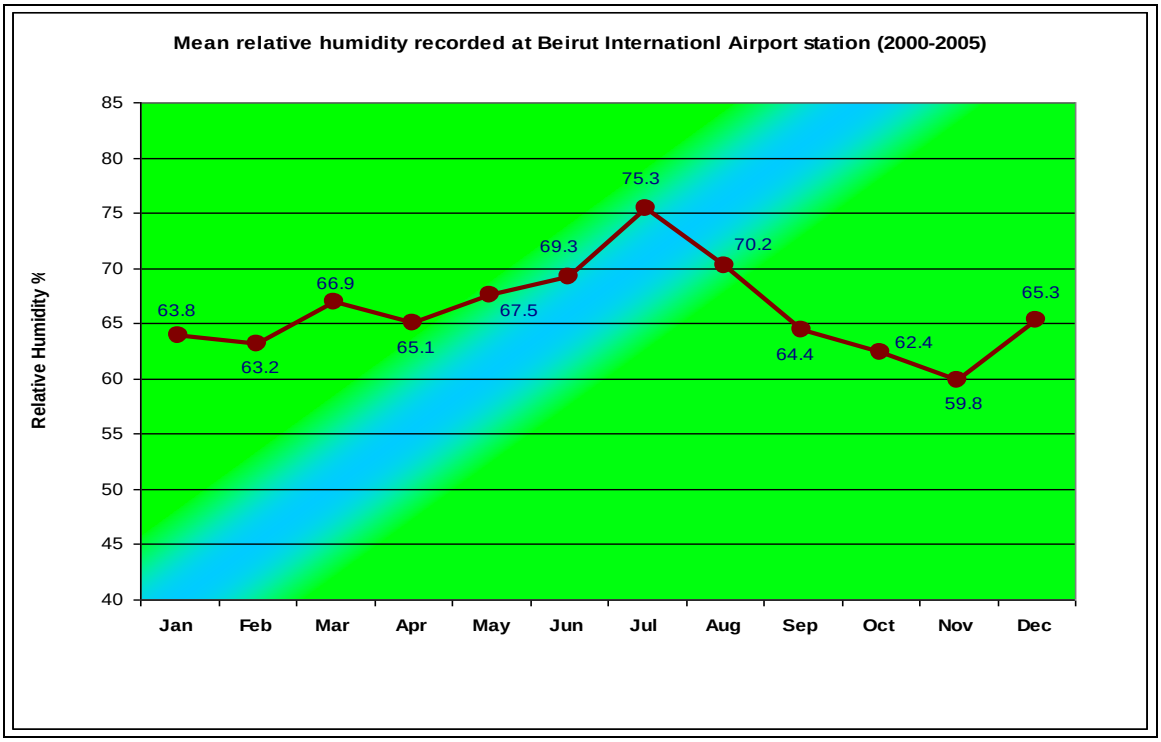


Chart 13: Mean monthly relative humidity record at RHBIA station (2000 until 2005).

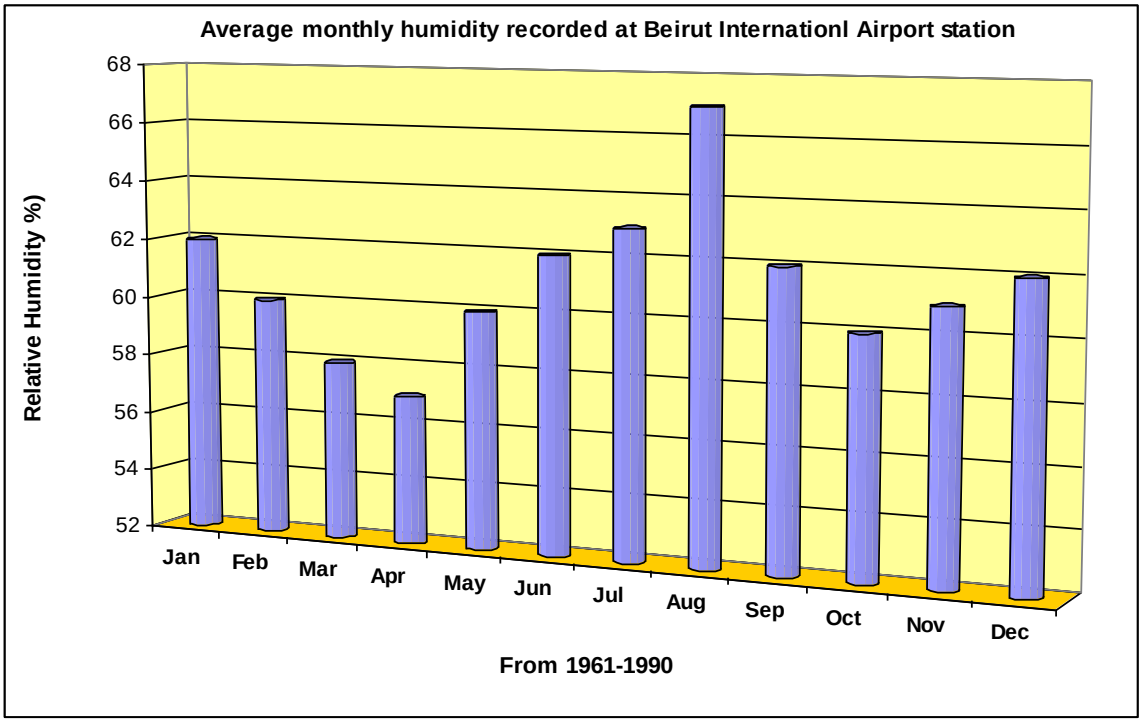


Chart 14: Average monthly relative humidity record at RHBIA station (1961 until 1990).

APPENDIX 7

Consultation Meeting on the Environmental and Social Assessment of the PCB managmenet project

List of Proposed Participants

Institution	Name	Telefone	Fax	Email	Confirmation
Ministry of Environment	Manal Moussallem	03 - 626708		manal.moussallem@undp-lebprojects.com	
	Roula Cheikh	03 - 545122		rola.sh@moe.gov.lb	
	Olfat Hamdan	03 - 646171		o.hamdan@moe.gov.lb	
	Hassan Hoteit	03 - 261455		hhoteit@moe.gov.lb	
Ministry of Energy and Water	Sassine Najjar	09 - 212164 09 - 212097	09 - 212 092	his assistant's e-mail address (tony Rizk) at toni.rizk@hotmail.com	
	Saber Yehia	03 - 371765		saberyehia@gmail.com	
	Fatima El Harakeh	03 - 960174		Fatima_harake@hotmail.com	
	Jihad Ghadieh	03 - 940692		jihadghadieh@hotmail.com	
	Wassim Nasr	03 - 849670		nasrwassim@hotmail.com	
Ministery of Public Health	DG	01 - 615730		directorgeneral@moph.gov.lb	
Municipality of Jieh	Prs. George Kazeh	07 - 995911		info@jieh.gov.lb	
Municipality of Zouk Mkayel	Prs. Nouhad Naufal	09 - 212212 /3 /4 /5 /6	09 - 212217		
Municipality of Baouuchriyeh - Jedideh - Sadd	Prs. Antoine Kaysar Gebara	01 - 892601 01 - 592611	01 - 901861		
Establishment of the water of Beirut and Mount Lebanon	Joseph Mkhael Nseir	01 - 386760 01 - 386761			
Council for Development and Reconstruction	Jaoudat Abou Jaoude				
National Congress of the Environment	Rabih Salem	70 - 000880			
Lebanese Environmental Movement	Paul Abi Rached	03 - 327975			
Northern Associations for Development, Environment and Patrimony (UNADEP)		05 467128			
Lebanese Association for the Protection of the Environment	Refaat Saba	06 - 626040 03-742472			
Matelec Group	Sami Soughayar (CEO)	09 - 620920	09 - 620934	matelec@matelecgroup.com	
Association of Lebanese industrialists (ALI)	Saad Oueini				
AUB	DR. May Jourdi				
BALAMAND	DR. Manal Nader				
NDU					

REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT

Beirut, 9-5-2013
Our Ref. : 1721/B

THE MINISTER

Dear Sirs,

Subject: Consultation meeting on the Environmental and Social Impact Assessment of the Sustainable POPs Management Project - PCB Management
Thursday May 23rd; 12 noon; Ministry of Environment – Green Room

The Ministry of Environment (MoE), with the support of the Global Environmental Facility (GEF) and the World Bank (WB), and in collaboration with the Ministry of Energy and Water – *Electricité du Liban*, is developing the PCB Management Project. The project's objective is to strengthen Lebanon's technical and managerial capacity for minimizing human and environmental exposure to PCBs, through the following:

- Maintaining an inventory and database of all PCBs in Lebanon;
- Strengthening the legal and regulatory framework for PCB management;
- Managing and disposing of all stocks of PCBs which pose a high risk in an environmentally sound manner;
- Demonstrating techniques for managing and disposal of other stocks of PCBs in an environmentally sound manner;
- Remediating selected high-risk sites contaminated with PCBs;

Based on WB's regulations, an Environmental and Social Impact Assessment (ESIA) of the proposed project (including an Environmental and Social Management Plan ESMP) has been prepared (enclosed full report in English, and Executive Summary in English and Arabic) in coordination with the United Nations Development Programme.

You are kindly invited to the public consultation workshop that will be held to discuss the ESIA/ESMP on Thursday May 23, 2013; 12 noon; MoE Green Room.

Confirmation prior to Monday May 20, 2013 on T: 01 976 555 Ext 489 or l.haidar@moe.gov.lb

Sincerely yours.

Nazem El-Khoury
Minister of Environment

Encl.: ESIA/ESMP of the PCBs Management Project
CC: - UNDP
- MoE – Service of Environmental Technology

Consultation Meeting on the Environmental and Social Impact Assessment for the PCBs Management Project

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4	Sabine Barakat	MOE		S.Barakat@moe.gov.lb.
5	Jihad Chadith	E.D.L	03/940692	jihad.edl@gmail.com.
6	Nada SABRA	UNIDO	03-736967	nadasabra@hotmail.com
7	DR Assaad KHOURY	MOPH	03/237957	assaadk@hotmail.com
8	Khatib Chalab	Jieh	03/526742	
9	Dr. Hanna Bou-Khalil	MoE	03/750225	h.khabib@moe.gov.lb.
10	Saline Najm	MOE	70/866323	S.najm@moe.gov.lb
11	Pauline Irani	Aramex Env Assoc pr.	03212102	paulineirani@hotmail.com
12	Rabih Salem	L.g.a.	03-608219	rabih@lebanongreenagenda.org
13	NOUR MASRI	UNDP - MoE Air Pollution Project	01-976555 #445	nour.masri@undp-lebproject
14				
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16				

Consultation Meeting on the Environmental and Social Impact Assessment for the PCBs Management Project

	Name	Institution	Phone Number	E-Mail
1	Capricia Chabarekh	ECODIT Liban	05458012	cchabarekh@ecodit.com
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3	Nizam Bou Khzam	LHEE	03-877486 05-720705	nizam_LHEE@hotmail.com
4	Charbel AKL	Directorate municipalities	09/212212	Fax = 09/203 213
5	~~Hiam Kreidie~~	Kesrouan Ftouh		
6	Hiam Kreidie	window to env.	03747800	hiamkreidieh@yahoo.fr
7	Wassim Nasr	EDL	03 849670	nasrwassim@hotmail.com
8	Lara Haidar	MoE-UNDP	03-024284	l.haidar@moe.gov.lb
9				
10				
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14				
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Photograph 3-1: Public consultation meeting of 25th of May 2013 – Green Room MoE

APPENDIX 8

الجمهورية اللبنانية
وزارة البيئة

الوزير

بيروت، في ١٧ كانون الأول ٢٠١٢

رقم التسجيل: ٥٢٢٥/ب

حضرة مدير عام مؤسسة كهرباء لبنان
المهندس كمال حايك المحترم

الموضوع: زيارات ميدانية الى محطات الجيّة، البوشرية، الجمهور، والزوق
المرجع: المشروع المقترح حول ادارة البيفينيل المتعدد الكلور

تحية طيبة،

بالإشارة إلى الموضوع والمرجع المذكورين أعلاه،

واستناداً الى المشروع التي تحضر له وزارة البيئة بالتنسيق مع مؤسسة كهرباء لبنان حول ادارة البيفينيل المتعدد الكلور (PCB Management Project) وتحديداً الدراسة البيئية المطلوبة من البنك الدولي والتي تعدّها الوزارة بالتنسيق مع برنامج الأمم المتحدة الإنمائي
(Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) of the Sustainable POPs Management project)

تجدون ادناه جدول الزيارات الميدانية المقترحة من قبل الاستشاري السيّد خليل زين (٠٣-٢١٩٠٥٩)، يعاونه السيّد هيثم مكحل والسيّدة اماني داغر؛ نتمنى عليكم تعميم هذا الجدول على المعنيين:

الموقع	التاريخ	الوقت
محطة الزوق	٢٠١٢/١٢/١٨	٨:٣٠ صباحاً
مستودع البوشرية	٢٠١٢/١٢/١٨	١٠:٣٠ صباحاً
الجمهور	٢٠١٢/١٢/١٨	١٢:٣٠ بعد الظهر
محطة الجيّة	٢٠١٢/١٢/١٩	٨:٣٠ صباحاً

للمزيد من المعلومات، يمكن مراجعة دائرة السلامة الكيميائة في وزارة البيئة على الرقم التالي:
٩٧٦٥٥٥- ٠١ مقسم ٤٠٨.

وتفضلوا بقبول فائق الاحترام شاكرين حسن تعاونكم.

ناظم الخوري
وزير البيئة

AA-F-١٤-٧-١-١/١

نسخة تبلغ إلى:
- وزارة البيئة - المديرية العامة للبيئة - مصلحة تكنولوجيا البيئة - دائرة السلامة الكيميائية

وزارة البيئة، مركز اللعازارية، الطابق الثامن، بلوك A-4 New
ص. ب.: ١١/٢٧٢٧، بيروت، لبنان - هاتف: ٩٧٦٥٥٥-١-(٩٦١)+ أو هاتف الرقم الرباعي: ١٧٨٩ - فاكس: ٩٧٦٥٣٤-١-(٩٦١)+
www.moe.gov.lb